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FLOOD CONTROL ROSEAU RIVER ROSEAU AND KITTSOY COUNTIES

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MINNESOTA FINAL ENVIRONMENTAL IMPACT STATEMENT

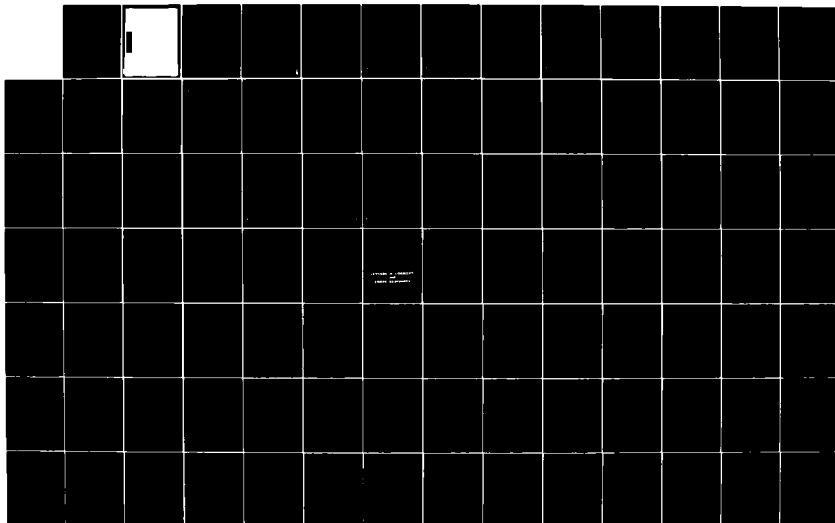
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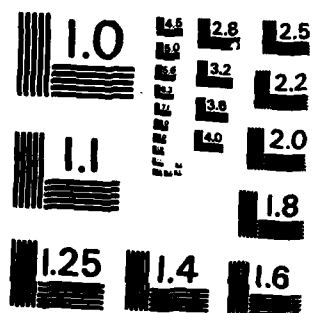
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. #121926	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) FINAL SUPPLEMENT, ENVIRONMENTAL IMPACT STATEMENT, FLOOD CONTROL, ROSEAU RIVER, ROSEAU AND KITTSON COUNTIES, MINNESOTA.		5. TYPE OF REPORT & PERIOD COVERED Final supplement - EIS
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Engineer District, St. Paul 1135 U.S. Post Office and Custom House St. Paul, MN 55101		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE September 1981
		13. NUMBER OF PAGES 186
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES  See also Final environmental impact statement, December 1976.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Environmental impact statements Flood control Roseau River		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This document supplements the Final Environmental Impact Statement (FEIS) for Flood Control, Roseau River, Roseau, Minnesota. Coordination with Federal and State agencies and public interest groups continued after completion of the FEIS. Two principal concerns arose during that coordination: the adverse impacts on fish and wildlife habitat and the potential for project-induced drainage. Proj- ect alternatives, including one not identified in the FEIS, were reevaluated and are discussed in this supplement. Through active coordination with the U.S. Fish		

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and Wildlife Service and the Minnesota Department of Natural Resources, measures to reduce impacts to the fish and wildlife of the watershed were identified, evaluated, and included in the project design. Vegetation would be planted specifically to provide wildlife habitat on land belonging to the State of Minnesota, including the temporary right-of-way. To address the concern of project-induced drainage, the outlets of ditches entering the river would be fixed in both elevation and capacity at the hydraulic control point. Fixing the ditch outlets would prevent anyone from altering the gradient of a ditch to extend it further from the river. The Fish and Wildlife Service recommended that the St. Paul District Engineer assume discretionally authority under Section 404 of the Clean Water Act to require individual permits for activities in wetlands presently regulated by a nationwide permit. The Minnesota Department of Natural Resources made the same request. The National Wildlife Federation indicated that conservation easements on wetlands would be the preferred method of preventing wetland drainage, but that they supported the discretionary authority approach as well; the Isaak Walton League agreed. The Corps of Engineers evaluated this issue and decided against assuming discretionary authority. The U.S. Environmental Protection Agency (EPA) issued a rating of EU-1 (environmentally unsatisfactory - sufficient information) for the project. The EPA indicated that while the project would continue to have significant adverse impacts, they would withdraw the unsatisfactory rating if the planned disposal of excavated material in wetlands in the Big Swamp reach is eliminated. However, it would be necessary to construct a road and five temporary bridges and disturb 87 acres of wetland to remove the material. It was determined that this would not be an economically feasible alternative.

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FINAL SUPPLEMENT  
ENVIRONMENTAL IMPACT STATEMENT  
FLOOD CONTROL,  
ROSEAU RIVER,  
ROSEAU AND KITTSO COUNTY, MINNESOTA

St. Paul District, Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

September 1981



FINAL SUPPLEMENT  
ENVIRONMENTAL IMPACT STATEMENT  
FLOOD CONTROL,  
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ROSEAU AND KITTSOON COUNTIES,  
MINNESOTA

TABLE OF CONTENTS

	<u>Page</u>
Summary	iii
Discussion of Alternatives	1
Project Location	1
Need for Further Discussion of Alternatives	1
Alternative 1: No Action	1
Environmental Impacts	1
Alternatives 2 and 3: Non-Structural Measures	5
Environmental Impacts	6
Structural Alternatives	7
Infeasible Structural Alternatives	11
Roseau Lake	11
Big Swamp	11
Urban Protection	11
Feasible Structural Alternatives	12
Alternative 4: Channel Modification (Selected Plan)	12
Project Description	12
Environmental Impacts	13
Measures to Reduce Impacts	15
Cutoff Channel Diversions	17
Elevated Channel	17
Fish Habitat Structures	18
Existing Oxbows	19
Side Ditch Outlets	20
Cultural Resources	23
Threatened and Endangered Species	23
Alternative 5: Channel Modification with Bypass at State Ditch 51	24
Environmental Impacts	24
Alternative 6: Channel Modification with Levees Between Roseau Lake and Big Swamp	24
Environmental Impacts	25
Alternative 7: In-Channel Floodway with Channel Modification through the Big Swamp	26
Environmental Impacts	26
Coordination	27
List of Preparers	33
Letters of Comment and Corps Responses	35
Appendix A: Exhibits	A-1
Appendix B: 404(b)(1) Evaluation	B-1
Appendix C: Coordination Letters	C-1



## LIST OF TABLES

<u>No.</u>		<u>Page</u>
1	Comparison of Alternative Impacts, Costs, and Benefits	8
1A	Comparison of Original Authorized Plan and Current Plan	10A
2	Catch per Effort (No./Hr.) of Species Collected by Electrofishing	16
3	Acreage within Increased Limits of Drainage	22

## LIST OF EXHIBITS

<u>No.</u>	
1	Roseau River, Minnesota, General Map of Basin
2	Project Alignment
3	Excavation Cross Sections and Locations
4	Perspective View of Elevated Channel
5	Diversion Structures
6	Oxbow Plugs
7	Fish Habitat Structures
8	Side Ditch Outlet Structures
9	Fish and Wildlife Service Letter to the St. Paul District, 30 November 1979
10	St. Paul District Letter to the Fish and Wildlife Service, 20 December 1979
11	Fish and Wildlife Service Letter to the St. Paul District, 7 January 1980



## SUMMARY

### Background

This document supplements the Final Environmental Impact Statement (FEIS) for Flood Control, Roseau River, Roseau, Minnesota, which was filed with the Council on Environmental Quality and noted in the Federal Register on 18 November 1977. The FEIS presents detailed discussions of the proposed project, affected environment, and environmental impacts of the proposal. A limited number of copies of the FEIS are available at the St. Paul District, Corps of Engineers, for those who have particular need for one.

Coordination with Federal and State agencies and public interest groups continued after completion of the FEIS. Two principal concerns arose during that coordination: the adverse impacts on fish and wildlife habitat and the potential for project-induced drainage.

This supplement was filed in draft form with the U.S. Environmental Protection Agency (EPA) and noted in the Federal Register on 11 July 1980. This Final Supplement will also be filed with the EPA and distributed for public review. It contains an analysis of changes made as a result of coordination to minimize the impacts of project construction, a 404(b)(1) evaluation of the proposed plan, and additional discussion of project alternatives. This Final Supplement also includes responses to letters of comment received on the draft. Exhibits 2B, 2C, and 6 have been changed to correct errors in the draft or to show changes made in response to comments.

### Major Conclusions and Findings

Project alternatives, including one not identified in the FEIS, were reevaluated and are discussed in this supplement. Through active coordination with the U.S. Fish and Wildlife Service and the Minnesota Department of Natural Resources, measures to reduce impacts to the fish and wildlife of the watershed were identified, evaluated, and included in the project design. Replacing fixed oxbow outlet plugs with stop-log structures would allow control and manipulation for waterfowl production. Vegetation would be planted specifically to provide wildlife habitat on land belonging to the State of Minnesota, including the temporary right-of-way. A Type 4 wetland intersected by the channel excavation would be replaced with an area designed to maximize waterfowl production.

Fish habitat would be preserved or provided for by several measures. The 11 3/4 miles of river channel bypassed by cutoff channels were originally intended to be plugged to form oxbows. To preserve the fish habitat in those areas, diversion structures would be installed so that only high flow would pass through the cutoff channels. The existing river channel would be undisturbed. To protect quality habitat for walleye within the project area, the method of excavation would be changed to an elevated channel through the downstream 6 miles of the river. The lower limit of excavation would be set 2 feet above



the hydraulic control points so that the channel bottom and bank would be undisturbed. Because of project constraints, it was not possible to use this method throughout the project area. However, in the 2 miles above the elevated channel reach, approximately 500 feet of channel in each mile would be left undisturbed. In the 10 miles above that reach, approximately 500 feet per mile would be excavated using the elevated channel method. To reduce impacts where the elevated channel could not be used, fish habitat structures would be installed. To ensure that the design of the structures would be well suited to the Roseau River, structures of several different designs would be placed during the first construction season. After a period of evaluation, a final design would be selected and the remaining structures would be put into place.

The second principal concern was the effect of the project on potential drainage of wetlands. To address that concern, the outlets of ditches entering the river would be fixed in both elevation and capacity at the hydraulic control point. Previously, ditch outlets were to be fixed for erosion control and only on the excavated bank. (Fixing the ditch outlets would prevent anyone from altering the gradient of a ditch to extend it further from the river.) The U.S. Fish and Wildlife Service recommended that additional control be provided by installing low-flow profile control structures. These structures, similar to lowhead dams, would restore the river profile to pre-project elevations for non-flood flows. Evaluation of these structures subsequently showed that their environmental impacts would be unacceptable. They were deleted from the project with the concurrence of the Fish and Wildlife Service. Subsequently, the Fish and Wildlife Service recommended that the St. Paul District Engineer assume discretionary authority under Section 404 of the Clean Water Act to require individual permits for activities in wetlands presently regulated by a nationwide permit.

#### Areas of Controversy

After the Fish and Wildlife Service recommended assumption of discretionary authority, the Minnesota Department of Natural Resources also made the same request. The National Wildlife Federation indicated that conservation easements on wetlands would be the preferred method of preventing wetland drainage, but that they supported the discretionary authority approach as well. The Izaak Walton League agreed with the National Wildlife Federation. The Corps of Engineers evaluated this issue and decided against assuming discretionary authority. The Corps felt that the fixed outlets of ditches and the constraints on drainage placed on the local sponsor to prevent exceedance of the design capacity of the channel would be sufficient to prevent project-induced wetland drainage.

#### Unresolved Issues

The U.S. Environmental Protection Agency (EPA) issued a rating of EU-1 (environmentally unsatisfactory - sufficient information) for the Roseau River Flood Control Project. The EPA indicated that while the project would continue to have significant adverse impacts, they would withdraw the unsatisfactory rating if the planned disposal of excavated material in wetlands in the Big Swamp reach



is eliminated. however, it would be necessary to construct a road and five temporary bridges and disturb 87 acres of wetland to remove the material. It was determined that this would not be an economically feasible alternative.

Relationship to Environmental Protection Statutes and Other Environmental Requirements

The following table describes the relationship of the selected plan to the requirements of environmental laws, executive orders, and other related requirements.



**Relationship of Plan to Environmental Requirement on Protection Statutes and Other Environmental Requirements  
Roseau River Flood Control**

**Federal Statutes:**

Archeological and Historic Preservation Act, as amended, 16 U.S.C. 469 et seq.  
 Clean Air Act, as amended, 42 U.S.C. 7401, et seq.  
 Clean Water Act, as amended (Federal Water Pollution Control Act) 33 U.S.C. 1251 et seq.  
 Coastal Zone Management Act, 16 U.S.C. 1451, et seq.  
 Endangered Species Act, as amended, 16 U.S.C. 1531, et seq.  
 Estuary Protection Act, 16 U.S.C. 1221, et seq.  
 Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1(12), et seq.  
 Fish and Wildlife Coordination Act, as amended, U.S.C. 661, et seq.  
 Land and Water Conservation Fund Act, as amended, 16 U.S.C. 4601-4601-11, et seq.  
 Marine Protection, Research and Sanctuaries Act, 22 U.S.C. 1401, et seq.  
 National Historic Preservation Act, as amended, 16 U.S.C. 470a, et seq.  
 National Environmental Policy Act, as amended, 42 U.S.C. 4321, et seq.  
 Rivers and Harbors Act, 33 U.S.C. 401, et seq.  
 Watershed Protection and Flood Preservation Act, 16 U.S.C. 1001, et seq.  
 Wild and Scenic Rivers Act, as amended, 16 U.S.C. 1271, et seq.

Selected Plan  
 FC<sup>1</sup>  
 FC  
 FC  
 NA<sup>2</sup>  
 FC  
 NA  
 FC  
 FC  
 FC  
 FC  
 NA  
 FC  
 FC  
 FC  
 NA  
 NA

**Executive Orders, Memoranda, etc.**

Floodplain Management (E.O. 11988)  
 Protection of Wetlands (E.O. 11990)  
 Environmental Effects of Major Federal Actions (E.O. 12114)  
 Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 Aug 76)

PC<sup>3</sup>  
 NA  
 FC  
 NA

**Required Federal Entitlements**

None

**State and Local Policies**

Minnesota Code of Agency Rules, Pollution Control Agency, WPC 14

FC

**Land Use Plans**

None

1. FC - Full Compliance
2. NA - Not Applicable
3. PC - Partial Compliance



## DISCUSSION OF ALTERNATIVES

### PROJECT LOCATION

1. The Roseau River basin, about 2,057 square miles in northwestern Minnesota and southcentral Manitoba, Canada, is part of the Hudson Bay drainage system (Exhibit 1). Approximately 60 percent of the basin lies within the United States, with the international boundary at river mile 91.2 (as measured from the mouth). The project plan provides for channel modification within the United States from river mile 93.5 to river mile 137.4 at the Roseau Dam. The project plan also includes remedial work along approximately 10 miles of the river in Canada extending downstream from the end of an existing floodway.

### NEED FOR FURTHER DISCUSSION OF ALTERNATIVES

2. Following the completion of the Final EIS, coordination continued with State and Federal agencies and interest groups. As a result, several design changes were made to the proposed plan to reduce the impact of the project by using alternative construction methods. Where modifications could not be made, features were added to partially replace lost habitat. In the course of this coordination, it was determined that alternatives should be re-evaluated. The following sections discuss measures evaluated as alternatives to the proposed plan. The section on Alternative 4 (the selected plan) discusses the proposed changes, the rationale for the changes, and an analysis of the environmental impacts of the proposed changes.

### ALTERNATIVE 1: NO ACTION

3. The without-the-project condition consists of floodplain regulations and flood insurance as required by Federal and State policies. By establishing floodplain management regulations as prescribed by the State of Minnesota, the city of Roseau and Roseau County became eligible in October 1978 and January 1980, respectively, to participate in the flood insurance program administered by the U.S. Department of Housing and Urban Development. The statutory floodplain management program of the Minnesota Department of Natural Resources presently regulates new development and redevelopment in the existing floodplain.

### ENVIRONMENTAL IMPACTS

4. While flood insurance does not prevent flood damage, it helps reimburse affected property owners of existing developments for losses sustained from floods; the flood losses are thus spread nationally. However, no reduction in overall average annual flood losses would be effected by implementation of flood insurance alone.

5. Floodplain regulation reduces future losses in the floodplain and minimizes flood damage to existing developments by the use of floodproofing measures. Annual flood damages could be reduced to a minor extent as particularly floodprone structures are abandoned. However, because floodplain regulation applies primarily to the city of Roseau, it would have little effect on agricultural flood damages. Some would also view its restrictions on individual freedom of land use as a negative impact.



6. Because the authorized project would not provide complete protection from flood events, these insurance and regulation programs would apply regardless of project construction, although the area of applicability would be redefined to the extent that the project reduces the size of the floodplain.

7. A no action alternative would avoid problems that may result from channel modifications and could result in long-term benefits to the natural environment of the area from the probable replacement of some structures in the floodplain by open areas. However, these effects would be insignificant on a basin-wide scale.

8. A no action alternative would not prevent future land-use changes in the Roseau River basin. Significant conversion of pasture, forest, and marsh to cultivated land has taken place since 1969 in the absence of a project and is expected to continue to occur with or without a project. This land-use conversion did involve some wetland acreage, particularly in the Roseau Lake bed area. Relatively little conversion of wetland acreage to cultivation is expected in the future, however, because the vast majority of wetland acreage is either in public hands or in an area of thick peat soil with very high moisture content that is unsuitable for farming. Future land use changes in the United States and within the project area are expected generally to involve the conversion of scattered remaining uncultivated parcels of 80 acres or less. Larger blocks of pasture and open land west of the Roseau River Wildlife Management Area may also be subject to cultivation, though poorer soils in this area would discourage conversion.

9. Clearing and draining of acreage in the Canadian portion of the Roseau River Basin has been occurring in the past few years and is expected to continue whether or not a project is implemented. Canadian land had not been cleared or drained as early as United States land because of a relative lack of grain terminals and capital resources. In addition, Canadian programs to encourage cultivation were not as extensive as U.S. programs. This picture appears to be changing. As Canadian farmers accumulate the necessary capital, they will continue to clear and drain additional lands regardless of the size of the Roseau River channel in the United States, which must accommodate additional drainage. Their activity may increase future flood flows and associated flood damages in the absence of a project if no institutional controls are placed on the amounts of flow which cross the Canadian-U.S. border.

10. A few farmers within the project area have constructed levees around their fields in an attempt to reduce losses from flooding of the Roseau River. These private levees vary from small knee-high dikes to larger, more sophisticated dikes, complete with pumps. Local banking officials and agricultural experts believe that diking activity would increase under a no action alternative. Current experience along the Red River of the North supports this claim, and preliminary Corps studies on farmstead and field diking do indicate marginal economic feasibility. The non-economic effects of such diking are not uniformly positive, however. Extensive diking can increase flood stages downstream, creating potentially greater damages for those property owners who do not dike their lands and homes. For these reasons, private diking has created, and will continue to create, significant levels of controversy and animosity among floodplain landowners both within the U.S. portions of the Roseau River Basin, and possibly between American and Canadian interests. Controversy on this issue and escalation of private diking practices have already occurred along the main stem of the Red River of the North and within the Pembina River Basin in North Dakota. Solutions to this problem of either a structural, non-structural, or combined nature will be necessary to resolve the present conflicts and ensure a more equitable means of flood damage reduction.



11. The following section presents some of the major perceptions prevalent in the study area. Where perceptions are presented: (1) they are identified as such; (2) sources of the perceptions are indicated; (3) they are evaluated according to their accuracy and reasons for arising and persisting; and (4) other major perceptions with some basis in fact are identified. Perceptions are presented in the report for a number of reasons. First, perceptions of reality form the basis for human action. Therefore, they constitute our best estimate of future social conditions and change in limited geographic areas. Second, the Roseau study has been portrayed by some as a "typical" confrontation between "economic development" and "natural environment" interests. This analysis is simplistic and it inaccurately stereotypes the groups involved and the interests that they represent. A presentation of the attitudes and perceptions of the key participants should bring the real interests and orientations more clearly into focus. This should assist in developing a plan which can be supported by all those concerned with the future conditions of Roseau County. Finally, interviews with key informants (i.e., individuals who have special knowledge and experience and/or formal recognition by their peers as representative experts) constitute an empirically acceptable method for ascertaining the beliefs, values, and behavioral motivations of an area and provide valuable, if not complete, insights into its social system.

12. Local officials, bankers, and farmers in the project area were interviewed in January 1979. These key informants believe that farmers who have lived in the area all their lives view the project as being strictly for flood control, not for drainage. Their most frequently voiced concern was that the duration of flooding should be reduced to avoid planting delays and to produce higher crop yields. According to local Soil Conservation Service officials, however, absentee owners and large landholders who have recently obtained land in the area may believe that the project will make additional drainage feasible. This class of landholder (perhaps 10 percent of all landowners in the project area) has grown significantly in the past 10 years. An incorrect perception of the project may lead this group to increase their efforts to clear land, slope their fields, and extend or improve ditches if the project is constructed. A no action alternative could eliminate a possible undesirable effect on the natural environment if this relatively small group of landowners acted on their belief.

13. Non-structured interviews of greater length were held with four riparian landowners in the county to obtain their perceptions concerning both the proposed and no action alternatives. One reason each gave for requesting flood reduction assistance was the need to reduce the annual flooding of agricultural lands by about 15 days. The respondents limited this objective only to lands already in production. They did not extend it to existing wetlands, did not view those lands as potential acreage for further agricultural expansion, and did not perceive further drainage of wetlands as feasible or desirable. The reasons given for this "limited" objective were consistent with, and supported by, the land use conditions reported in paragraph 8.

14. Additional interviews were conducted with three key local residents. All three are lifelong farmers in the county, with inheriting farming sons; descendants of the first settler families of the county; and past or present elected public officials. Each objected to being categorized as "pro-" economic development and "anti-" environment simply because they support the Roseau River project. They considered such stereotyping to be an inaccurate perception of their needs, intentions, and values, as well as logically inconsistent with their families' actions in the area over the last several generations. They discussed their accomplishments of the last several decades, which they viewed as a successful attempt to manage their lands for agricultural economy, natural space integrity, production, and aesthetic enjoyment. In short, they perceive themselves as non-consumptive users and caretakers, rather than industrial entrepreneurs interested solely in optimal short-term economic return.



15. In support of their statements, the respondents presented a number of points concerning past land-use actions in the area. First, they claimed that they and their fathers are due partial credit for the establishment of the 61,000-acre Roseau River Wildlife Management Area and for the development of Hays Lake State Park. Second, they cite their open and active opposition to a proposed transfer of 10 sections of peat land from the public domain to private, agricultural use. Third, they state that they have viewed with dismay past successful attempts to purchase and to convert uncleared, undrained land by "outsiders" who have engaged in speculative tillage for potential resale as "quality" farmland. Finally, they cite the belief of most farmers who support the project that virtually all of the agriculturally desirable lands in the county have already been acquired, drained, cleared, and planted. In their opinion, this was completed from the mid-1950's to early 1960's, with the assistance of the Soil Conservation Service. On this basis, they do not object to the Reuss Amendment, which ended U.S. Department of Agriculture cost-sharing programs for drainage of Type 3, 4, and 5 wetlands.

16. Research in 1978 by the St. Paul District regarding attitudes of farmers in Renville County, Minnesota, on natural resource issues and drainage actions indicated that farmers are not only businessmen seeking a profit from their agricultural investments, but they are also concerned about environmental values. This research suggested that attainment of a "reasonable" profit is a necessary precondition to the development of an "environmental ethic" among farmers. After an acceptable level of economic return had been achieved, a majority of farmers favored preservation of a quality environment, and opposed obtaining additional profits through environmentally destructive practices. These results are believed applicable to the Roseau River area and point out the fallacy of interpreting controversy on the project in terms of economic development versus natural environment. Moreover, these results indicate that maintenance of the project area's economic base is critical to the enlistment of local support for natural resource preservation.

17. The farmers and a number of local officials who were interviewed consider the no action alternative to be an unfair denial of a limited, legitimate request for assistance. They perceive their record of concern and stewardship over the natural environment in Roseau County as a fine one, pointing to both the proportion and quality of county acreage in the public domain. These project supporters also wish to minimize the potential harm from the proposed action upon both fishery and wetland resources. As a result, they have expressed willingness to take actions recommended by the government to preclude encroachment on any non-drained lands rendered vulnerable by the project.

18. These key informants feel that the project plan (1) provides needed relief and assistance to the project area by protecting its economic base (i.e., farmlands); (2) has sufficient structural and institutional controls to protect natural resource values; and (3) includes adequate mitigation for any adverse effects. For these reasons, choice of the no action alternative would be seen as unfair by local residents. As a consequence, several influential local individuals have indicated their intention to withdraw from positions of key responsibility for conservation and enhancement of the existing natural areas in the county if assistance is not provided. Whether this potential withdrawal would be voluntary or forced is debatable. The power base for these influential citizens resides in their ability to obtain the



assistance desired by their "constituents." If they fail at this task, their past behaviors of protecting the natural areas could be viewed locally as concessions to those groups which oppose the local interest. This reaction would reflect, to some degree, bitterness toward what they view as externally imposed conservation "extremism" which they perceive as solely serving the recreational pleasures of transient city dwellers who contribute little to the local area. Local officials may also withdraw political support for enforcement of existing regulations on floodplain development.

19. The potential for withdrawal of local support for conservationist practices has strong implications for present and future land use issues in the county, given recent trends toward land price inflation, absentee agribusiness, and entrepreneur acquisition of presently marginal lands. The perceived result of withdrawal would be the shift of Roseau County from a comparatively well-managed rural area towards uncontrolled exploitative development and consequent deterioration of existing natural habitat.

20. Whether local reaction to selection of the no action alternative would result in an anti-conservation backlash is a point of debate between the several interests involved. Natural environment proponents view this scenario as no more than a veiled threat, with little relation to reality. It is certainly the case, however, that a substantial minority of naturally beneficial lands within Roseau County are in private ownership and control, and have potential for being adversely affected should a backlash occur. In addition, historic evidence shows that individual, uncoordinated efforts to provide flood damage relief are often the alternatives of greatest degradation, especially when those instituting these measures believe that other single-use representatives are unresponsive to their needs for protection.

#### ALTERNATIVES 2 AND 3: NON-STRUCTURAL MEASURES

21. Although four non-structural alternatives were evaluated, only two were considered feasible. In general, non-structural measures only apply to urban flooding situations and for the most part do not reduce damages in the downstream agricultural areas. The most basic non-structural alternative would be the implementation of a plan for temporary evacuation of the floodplain when flooding was predicted by the flood forecast service of the National Weather Service. Another alternative would be to provide emergency protective measures such as dikes and sandbags. Emergency protection would eliminate evacuation unless the structures were in danger of being breached. Flood-proofing of structures could be accomplished by raising the main level of the structure above the surface elevation of the flood. Many of the impractical aspects of the above alternatives could be eliminated by permanent evacuation of the floodplain. No structural damage and minimal safety hazards would then be likely. The alternatives, except permanent evacuation, would be utilized in conjunction with national flood insurance programs (discussed under Alternative 1).



## ENVIRONMENTAL IMPACTS

22. Biological impacts would be minimal for most non-structural measures. Emergency protection would be the only alternative with any significant potential for environmental damage. Emergency levees could increase river sedimentation since little stabilization of the raw surfaces would be likely. Additionally, habitat for wildlife might be buried by the structures, or trees and brush might be cleared to provide the desired alignment. With the exception of tree clearing, these effects should be temporary (during the flooding). However, emergency structures are often left in place, due to the cost of removal and the likelihood of replacing them the following year.

23. A gain in wildlife habitat could result from abandonment of the floodplain. Urban open space and greenbelt would increase. Reduced runoff of residential fertilizers and pesticides would result in a moderate improvement of water quality in the area. One potential impact of all these non-structural measures would be difficult to predict: if residents were not satisfied with the degree of protection offered by such measures, they might take independent action to achieve flood protection. Some residents have already installed dikes or floodwalls in the project area. If no regard were given to engineering, environmental, and aesthetic considerations, such structures could cause significant impacts. Sedimentation, elevated turbidity, destruction of terrestrial and aquatic habitat, and interference with drainage patterns and river capacity could be expected. Other impacts would be dependent on the extent of the actions taken.

24. Most of the impacts associated with non-structural flood control measures would be socio-economic. Flood warning and temporary evacuation or floodproofing would not prevent flooding and the disruptions to everyday life associated with it. Floodproofing would prevent damage; however, normal life patterns in times of flood would still be somewhat disrupted. If successful, emergency measures would protect homes, businesses, and institutions. This alternative would require mobilization of city government personnel and volunteers plus a significant commitment of community resources for each flood event and would seriously disrupt normal community activities and commerce.

25. Permanent evacuation would eliminate these problems, but community cohesion would be reduced by relocation of established neighborhoods. Businesses operating at marginal levels might close. Some residents and businesses might leave the area, adversely affecting community growth. Property values could increase in areas placed in demand as a result of abandonment of the floodplain. Floodproofed property could increase in value if it no longer sustains damage. Tax revenue would be lost where property was abandoned, but the increase in value of property that no longer sustains flood damage could be reassessed to generate more revenue.



26. Employment opportunities would increase during floods if emergency protection were instituted. Likewise, the floodproofing of buildings could increase employment in the building trades. Some loss of employment could result from migration of businesses out of the local area.

27. The flood warning/temporary evacuation alternative would mean continued anxiety for the residents during flood seasons and community disruptions during actual floods. Damages would remain high since fixed developments such as homes, businesses, utilities, schools, and agricultural lands would remain subject to flooding. Only the most portable personal belongings could be saved. Flood warning/temporary evacuation was, therefore, rejected as a feasible alternative.

28. Emergency protection would provide greater flood control benefits than flood warning/temporary evacuation. Flood damages to the city of Roseau and to rural roads and bridges could be reduced through implementation of emergency measures. Such measures would require expenditures during each flood season, and could have significant environmental impacts. Undue confidence in the integrity of temporary structures could lead to a dangerous situation in areas afforded emergency protection. Emergency measures would not eliminate or even significantly reduce damages to crops and rural property, which total 81 percent of the damages in the project area. Because of the significant environmental impacts and the inadequacy of protection from emergency measures, this alternative was also removed from consideration as an alternative.

29. The floodproofing alternative and the permanent evacuation alternative could each provide a permanent solution to urban flooding. Each alternative would require alteration to use of the floodplain in the city of Roseau, at significant costs. These alternatives would avoid the environmental consequences of emergency measures. As with emergency action, however, little or no flood control benefits could be provided for those areas subject to flooding of crops and rural property. Floodproofing was designated Alternative 2; permanent evacuation, Alternative 3. These alternatives were evaluated and are displayed in the comparison matrix (Table 1).

#### STRUCTURAL ALTERNATIVES

30. Structural methods of flood control would not only decrease the frequency of flood damages but also the duration of flooding. Since the growing season is short in northwestern Minnesota, any reduction in flood duration improves opportunities for crop development during the frost-free season. Several methods of accomplishing the project purposes have been identified. Each has advantages and disadvantages, but some lack economic feasibility or are not supported by the local sponsor. Alternatives lacking feasibility are only briefly discussed below. Feasible alternatives are discussed below, identified by number, and displayed in a matrix (Table 1).



TABLE 1. COMPARISON OF ALTERNATIVE IMPACTS, COSTS, AND BENEFITS

IMPACT	1. NO ACTION	2. FLOOD PROOFING	3. PERMANENT EVACUATION
AGRICULTURAL LAND AFFECTED (ACRES)	Potential loss due to levee placement by others.	0	0
WOODLAND AFFECTED (ACRES)	Potential loss due to levee placement by others.	0	0
WETLAND AFFECTED (ACRES)	Potential loss due to levee placement by others.	0	0
WATER QUALITY	Potential degradation from placement of levees and ditches by locals.	No Effect.	Potential improvement due to decreased urban runoff.
WATER TEMPERATURE	Potential increase due to clearing.	No Effect.	Potential decrease in maxima and fluctuation due to planting or natural succession.
AQUATIC ECOSYSTEM	Potential loss of spawning and invertebrate habitat due to sedimentation from levee construction.	No Effect.	Slight increase in carrying capacity if cover and water quality improve.
WATERFOWL	Potential loss of nesting and feeding habitat.	No Effect.	Potential gain in nesting habitat. Reduced conflict with man.
TERRESTRIAL ECOSYSTEM	Potential loss of nesting, feeding, and cover habitat.	No Effect.	Potential improved wildlife corridor through urban area.
THREATENED AND ENDANGERED SPECIES	No Effect.	No Effect.	No Effect.
CULTURAL RESOURCES	Potential loss if levees built without regard for cultural resources.	No Effect.	No Effect.
RECREATION	No Effect.	No Effect.	Potential increase in urban park and open space.
AESTHETICS	Potential lack of consideration of aesthetics in independent actions.	Elevated structures may have an unattractive appearance.	Potential increase in urban greenbelt/ scenic river view.
POPULATION/FARM DISPLACEMENT	Potential abandonment of periodically flooded lands and structures.	Potential for abandonment of low value or poorly maintained structures.	Major relocation of portions of the community including potential loss of commercial establishments.
EMPLOYMENT/LABOR FORCE	Temporary employment during floods or construction of independent measures.	Temporary employment of construction trades.	Temporary employment for construction and moving. Potential reduction if businesses relocate or close.
BUSINESS ACTIVITY	Increased activity in construction, supply, and equipment trades. Loss of business during floods.	Increased activity for construction and materials. Isolation of businesses during floods.	Temporary increase in construction and moving. Potential permanent loss of businesses leaving community.
PROPERTY VALUES	Periodic flooding could cause below average property values.	Perched buildings may have reduced value. Reduction in flooding would increase values.	Value of evacuated properties would decline. Demand may increase values outside floodplain.
TAX REVENUES	Periodically flooded lands could be abandoned for taxes. Successful protection may raise revenues and taxes.	Increased value of protected structures may increase tax revenues.	Newly occupied or relocated structures may generate increased revenues. Evacuated land would be removed from tax rolls.
PUBLIC FACILITIES	Damage to facilities in the floodplain would continue.	Public facilities would be protected from damage but isolated by floods.	Cost of new facilities. Potential increase in open space.
PUBLIC SERVICES	Services interrupted by flooding.	Same as 1.	No Effect.
COMMUNITY COHESION	Potential disruption if independent actions taken without community consensus.	No Effect.	Disruption of established neighborhoods.
DESIRABLE COMMUNITY GROWTH	Floodplain regulation would regulate community growth.	Same as 1.	Opportunity for planned development. Potential loss from businesses which leave area.
DESIRABLE REGIONAL GROWTH	No contribution to regional growth.	Same as 1.	Potential loss of growth if agricultural land usurped for housing development.
MAN-MADE RESOURCES	Minimal but unknown impact due to unpredictable nature of independent actions.	No Effect.	No Effect.
NATURAL RESOURCES	Potential loss of woodland, wetland, wildlife habitat due to independent action.	No Effect.	Potential for eventual return to natural succession in river and riparian habitat.
AIR QUALITY	No Effect.	No Effect.	Potential temporary decrease if demolition is used.
NOISE	Temporary increase during flood fighting, long-term if pumping is used for interior drainage of levees.	Temporary increase during construction activities.	Temporary increase during moving, rebuilding, and relocations.



TABLE 1. COMPARISON OF ALTERNATIVE IMPACTS, COSTS, AND BENEFITS (CONT.)

ALTERNATIVE IMPACT	4. CHANNEL MODIFICATION	5. CHANNEL MODIFICATION WITH STATE DITCH 51 BYPASS	6. CHANNEL MODIFICATION WITH LEVEES BETWEEN ROSEAN LAKE AND BIG SWAMP	7. FLOODWAY WITH CHANNEL MODIFICATION THROUGH BIG SWAMP
AGRICULTURAL LAND AFFECTED (ACRES)	575	630	510	940
WOODLAND AFFECTED (ACRES)	690	710	610	730
WETLAND AFFECTED (ACRES)	620	610	640	620
WATER QUALITY	Increased turbidity and sedimentation during construction, slight increase after decrease in dissolved oxygen due to increased temperature and decreased turbulence.	Same as 4 except reoperation from flow over large rocks and riffles in bypass reach.	Same as 4, except slight reoperation in levee reach due to channel bottom preservation.	Slight increase in turbidity during construction. Same as 4 in Big Swamp reach.
WATER TEMPERATURE	Increased maxima and daily fluctuation due to reduced depth, increased surface area and clearing.	Same as 4, but no increase in bypass reach.	Same as 4, but greater change in levee reach.	Similar to but less than 4 resulting from clearing. No change in depth or surface area.
AQUATIC ECOSYSTEM	Approximately 50% loss of organic matter from riparian vegetation. Significant loss of fish and forage habitat. Shift to tolerant rough fish where depth, current, and cover reduced. Only partially offset by undisturbed channel bed and fish habitat structures.	Same as 4, but no disturbance in high quality downstream habitat. Riparian habitat intact in lower 6 miles.	Same as 4, but channel bed intact in medium quality reach but with total loss of riparian vegetation along levees.	Same as 4 in Big Swamp reach (Northern pine habitat) but substantial reduction in impacts elsewhere due to low-flow channel preservation. Greater loss of riparian vegetation.
WATERFOWL	Loss of nesting and feeding habitat on one bank and river bottom loss to cavity-nesting species in upstream reach.	Same as 4, but habitat preserved in bypassed reach. Wetland impact on bypass.	Same as 4, disturbance of nesting by levees, but feeding habitat preserved in levee reach.	Same or slightly greater than 4, but river bottom intact outside Big Swamp.
TERRESTRIAL ECOSYSTEM	Loss of riparian habitat, fringe and corridor on one bank for 44 miles.	Same as 4, but some high quality riparian habitat preserved and 10 acres less wetland impacted.	Same as 4, but twice the habitat loss in levee reach.	Same as 4, but increased clearing for wider channel.
THREATENED AND ENDANGERED SPECIES	No Effect.	No Effect.	No Effect.	No Effect.
CULTURAL RESOURCES	Adverse impact on Olson Mound Group.	Same as 4, plus bypass area has not been investigated.	Same as 4, plus potential effect of levee placement unknown.	Same as 4, plus potential increase in effect from wider excavation.
RECREATION	Improved access to remote areas on spoil piles. Movement of motor boats restricted by structures and less depth (except lower 6 miles).	Same as 4.	Same as 4.	Less restriction on boats than 4 except Big Swamp reach. Access same as 4.
AESTHETICS	Ditch-like appearance, smooth river bottom, man-made structures.	Same as 4, but reach with highest aesthetic value preserved.	Same as 4 plus unnatural levees on both banks.	Same as 4 but river bottom would retain natural appearance except Big Swamp.
POPULATION/FARM DISPLACEMENT	Relocation of four outbuildings. No displacement of houses.	Same as 4.	Same as 4.	Same as 4.
EMPLOYMENT/LABOR FORCE	Temporary employment during four construction seasons.	Same as 4.	Same as 4.	Same as 4.
BUSINESS ACTIVITY	Increase in materials and services businesses during construction. Increase in community businesses from increased agricultural production.	Same as 4.	Same as 4.	Same as 4.
PROPERTY VALUES	Land and structures protected from flooding would increase in value.	Same as 4.	Same as 4.	Same as 4.
TAX REVENUES	Tax revenues would be maintained or increased on protected property.	Same as 4.	Same as 4.	Same as 4.
PUBLIC FACILITIES	Reduced damage to facilities. Replacement of old bridge.	Same as 4.	Same as 4.	Same as 4.
PUBLIC SERVICES	No Effect.	No Effect.	No Effect.	No Effect.
COMMUNITY COHESION	No Effect.	No Effect.	No Effect.	No Effect.
DESIRABLE COMMUNITY GROWTH	Economic benefits of urban protection and agricultural production could stimulate growth.	Same as 4.	Same as 4.	Same as 4.
DESIRABLE REGIONAL GROWTH	Improved productivity due to reduced flooding could contribute to regional growth.	Same as 4.	Same as 4.	Same as 4.
MAN-MADE RESOURCES	Alteration of man-made channel in portions of river.	Same as 4.	Same as 4.	Same as 4.
NATURAL RESOURCES	Significant impact on wetland, woodlands, river, fish, and wildlife habitat.	Same as 4.	Same as 4.	Same as 4.
AIR QUALITY	Temporary decrease during construction from machinery.	Same as 4.	Same as 4.	Same as 4.
NOISE	High levels from large equipment during construction.	Same as 4.	Same as 4.	Same as 4.



TABLE 1. COMPARISON OF ALTERNATIVE IMPACTS, COSTS, AND BENEFITS (CONT.)

ALTERNATIVE COSTS AND BENEFITS	6. CHANNEL MODIFICATION WITH LEVERS BETWEEN ROUSSEAU LAKE AND BIG SHAMP						
	1. NO ACTION	2. FLOOD PROOFING	3. PERMANENT EVACUATION	4. CHANNEL MODIFICATION	5. CHANNEL MODIFICATION WITH STATE DITCH 51 BYPASS	7. FLOODWAY WITH CHANNEL MODIFICATION/ BIG SHAMP	
FEDERAL FIRST COST <sup>a</sup>	0	Not Determined	Not Determined	23,000,000	23,572,000	25,211,000	24,124,000
NON-FEDERAL FIRST COST	0	Not Determined	Not Determined	1,140,000	1,704,000	1,159,000	1,696,800
TOTAL FIRST COST	0	Not Determined	Not Determined	24,140,000	25,276,000	26,370,000	25,760,000
AVERAGE ANNUAL COST	0	Not Determined	Not Determined	1,033,800	1,080,500	1,125,000	1,099,000
BENEFIT/COST RATIO	NA	Not Determined	Not Determined	1.23	1.18	1.09	1.16
AVERAGE ANNUAL BENEFITS	0	Not Determined	Not Determined	1,274,000	1,274,000	1,229,000	1,274,000
URBAN PROPERTY	0	Not Determined	Not Determined	270,700	270,700	270,700	270,700
RURAL PROPERTY	0	Not Determined	Not Determined	246,800	246,800	232,200	246,800
AGRICULTURAL (CROP)	0	Not Determined	Not Determined	645,200	645,200	607,800	645,200
ROAD AND BRIDGE	0	Not Determined	Not Determined	34,300	34,300	34,300	34,300
FISH AND WILDLIFE	0	Not Determined	Not Determined	0	0	0	0
TOTAL FLOOD CONTROL	0	Not Determined	Not Determined	1,197,000	1,197,000	1,145,000	1,197,000
AREA REDEVELOPMENT	0	Not Determined	Not Determined	77,000	77,000	84,000	77,000

a. Includes \$3,128,000 for channel work in Canada.



TABLE 1A. COMPARISON OF ORIGINAL AUTHORIZED PLAN AND CURRENT PLAN

Costs and Benefits	1) Original Authorized Plan	2) Current Proposed Plan
FEDERAL FIRST COST	\$14,864,000	\$23,000,000 <sup>3)</sup>
NON-FEDERAL FIRST COST	1,081,000	1,140,000 <sup>4)</sup>
TOTAL FIRST COST	15,945,000	24,140,000
AVERAGE ANNUAL COST	702,700	1,033,800
BENEFIT/COST RATIO	1.81	1.23
AVERAGE ANNUAL BENEFITS	1,274,000	1,274,000
URBAN PROPERTY	270,700	270,700
RURAL PROPERTY	246,800	246,800
AGRICULTURAL (CROP)	645,200	645,200
ROAD AND BRIDGE	34,300	34,300
FISH AND WILDLIFE	0	0
TOTAL FLOOD CONTROL	1,197,000	1,197,000
AREA REDEVELOPMENT	77,000	77,000

1) Features reported in October 1971 GDM - October price 1980 price levels.

2) Features reported in May 1980 GDM Supplement 2 - October 1980 price levels.

3) Includes \$3,649,000 for an increase in mitigation costs in Canada recommended by the International Joint Commission and \$4,487,000 for features developed in coordination with MnDNR and US FWS to offset fishery and wildlife losses.

4) Includes \$59,000 for lands added to accommodate mitigation features.



## INFEASIBLE STRUCTURAL ALTERNATIVES

### Roseau Lake

31. The area known as Roseau Lake (Exhibit 2C) was considered for development as an impoundment. This area is the junction of the Roseau River and Pine and Sprague Creeks, two major tributaries. Until it was drained for agricultural purposes in the early 1900's, it served as a natural retention basin, impounding and slowly releasing floodwaters.

32. It would be necessary to construct dikes and an impoundment structure for Roseau Lake to function as a flood control impoundment. In addition, the impoundment alone would not provide any flood protection upstream. To protect Roseau from floods, it would be necessary to modify the channel between the lake and Roseau to increase its capacity. This modification would be virtually the same as that in the proposed plan.

33. Since the Roseau Lake basin is shallow, a substantial area (approximately 27,000 acres) would be required for impoundment of floodwaters. A second alternative was identified which would include a second impoundment on Sprague Creek. However, to achieve an approximate 1-foot reduction in depth and a 1,700-acre reduction in size of Roseau Lake, impoundment would require \$12,000,000 for the construction of a Sprague Creek impoundment. As a result, the Sprague Creek impoundment would not be economically feasible. Additionally, the Roseau Lake impoundment would flood areas protected by the proposed project. The local sponsor is unable and unwilling to provide required flooding rights for this alternative, and this alternative lacks economic feasibility.

### Big Swamp

34. Another alternative investigated would involve construction of an impoundment in the area known as the Big Swamp. The Big Swamp extends from the downstream end of the Duxby Levee to State Ditch 51 (Exhibit 2A and 2B). Neither the city of Roseau nor the rural area upstream would receive any flood damage reduction from this river impoundment alone, so channel modification would be required for the river between Roseau and the impoundment. A Big Swamp impoundment would provide flood protection for areas downstream, prevent any increase in flows into Canada resulting from the project, and provide a conservation pool for wildlife. Extensive dike construction would be required to form an impoundment because of the flat topography of the area. The depth and duration of inundation of an impoundment in Big Swamp would be significantly increased over depth and duration of overbank flows occurring under existing conditions.

35. Benefits for wildlife would accrue from an impoundment but with a significant loss or alternation of existing habitat. Mitigation requirements are likely to be substantial. Although this alternative appears to demonstrate economic feasibility at the 3 1/2-percent interest rate, implementation would require reauthorization by Congress. Because recalculation of the benefit/cost (B/C) ratio at the current interest rate would be necessary, the project would no longer be feasible.

### Urban Protection

36. Increased urban protection of Roseau was also investigated. Two levels of protection (50-year and 100-year) were reviewed. Channel enlargement upstream of the existing dam and appropriate enlargement downstream would provide protection from a 50-year flood. It would be necessary to construct flood barriers, levees, and interior drainage facilities to provide 100-year protection; and flows in excess of design capacity could cause very large damages due to overtopping of structures. Both alternatives lack economic feasibility. Present construction costs and interest rates would further reduce economic feasibility.



## FEASIBLE STRUCTURAL ALTERNATIVES

### Alternative 4: Channel Modification (Selected Plan)

#### Project Description

37. In the selected plan, flood control would be achieved by widening the channel along one bank from the dam in the city of Roseau to within 2- $\frac{1}{2}$  miles of the Canadian border (Exhibit 2A, 2B, 2C). Bottom widths of the widened channel would vary between 48 and 114 feet, depending on the capacity required for each reach. Channel capacity would vary between 1,150 and 9,500 cubic feet per second (cfs). A typical cross section of the widened channel is shown in Exhibit 3.

38. The river reach extending from State Ditch 51 downstream to the lower project limit would be excavated with an elevated channel bottom. The lower limit of excavation would be set 2 feet above the river bottom at the hydraulic control points (shallowest areas). Channel widths would vary between 98 and 185 feet.

39. A similar method of excavation would be used in approximately 10 percent (300 to 500 foot reaches) of the Big Swamp reach (State Ditch 51 to the downstream limit of the Duxby levee), with the exception of the lower 2 miles where four reaches (250 feet each) would be left unexcavated. This design would prevent excavation of the majority of the existing hydraulic control points without altering the overall hydraulic design characteristics within Big Swamp. In this manner, the proposed discharges into Canada will remain unchanged from previous agreements. (Elevated channel construction for this reach is also discussed in paragraph 107.) A typical cross section and location list are shown in Exhibit 3.

40. Except in the city of Roseau where space is limited, the excavated material would be distributed along the river in uniformly shaped piles set back from the edge of the completed channel from 20 to 92 feet, depending on foundation stability conditions. Disposal piles would be graded to improve drainage and appearance, and the riverward sides of the piles would be seeded and/or planted with grasses, brush, and/or trees following construction to improve bank stability and provide wildlife cover. Berms between disposal piles and channel slopes, plus the slopes themselves would be seeded only with grasses. In the Roseau Wildlife Management Area, revegetation would consist of quarter-mile strips of shrub plantings alternating with quarter-mile strips of clover and grass. These plantings would be made on the riverward slope, top, and landward side of the disposal pile.

41. Channel cutoffs totalling approximately 5 miles in length would be installed at eight locations to bypass approximately 11- $\frac{3}{4}$  miles of existing channels during high flows (Exhibit 2A, 2B, 2C). Although the proposed cutoffs are numbered from 1 to 10, Cutoffs 2 and 4 have been deleted and Cutoff 10 consists of 2 sections. Diversion structures, consisting of rock-filled gabion baskets over earth fill, would be placed in the constructed cutoff channel to divert low and normal flows through the existing channel (Exhibit 5). The existing channel would not require excavation.

42. Levees would be installed at two locations. (A typical cross section is shown in Exhibit 3.) The proposed 1.9-mile long Kittson County levee would join an existing levee at the Canadian border (Exhibit 2A). A 5.8-mile levee would be constructed in the vicinity of Duxby (Exhibit 2B) along the south bank. The alignment of this levee has been changed to preserve the existing channel at Cutoff 5. A continuous disposal bank between 2 and 4 feet high would be placed along Cutoff 9 to prevent high flows from reaching adjacent fields. Continuous disposal banks would be placed along Cutoff 8 (north side) and along the south bank from the west (downstream limit) of the Duxby levee to the west limit of Section 22 (Badger Creek area). These disposal piles would be placed so that the Minnesota Department of Natural Resources (MDNR) may use them in the future for construction of waterfowl impoundments.



43. Six (2-7) of the thirteen existing oxbows (formed by earlier channelization) would be plugged at both the inlets and the outlets. Permanent plugs at the inlets would be one-half of the bank height to control sedimentation of the inlet. Outlet plugs would be low structures with drawdown capability for water level management. The outlet plug for oxbow 7 would be located approximately 225 yards landward. Other oxbows (1, 8-10) would be left open at the outlets to allow access by fish for spawning. Temporary plugs would be placed at the inlets to prevent sedimentation during construction. Oxbows 12 and 13 would not be modified. Oxbow 13 has an artesian water supply and is no longer connected to the river. Typical oxbow plugs are shown in Exhibit 6.

44. Structures would be placed in the river at 58 locations in reaches where it is not possible to provide an elevated channel. These structures would partially compensate for fish habitat destroyed by excavation. A gabion wing deflector would be built out from the bank. The remaining channel bottom (which would contain the concentrated flow) and the opposite channel bank would be protected with riprap. Large rocks would be randomly distributed on the channel bottom. Immediately downstream of the structure, a hole would be excavated and lined with riprap. Cross sectional and perspective views of these structures as well as their locations are shown on Exhibit 7.

45. Work would be done at most of the outlets of 87 ditches which are tributary to the river. The purpose of the work would be to control erosion and prevent project-induced drainage resulting from lowering of ditch outlets made possible because of the lowered water surface profile. Ditches would be fixed at their hydraulic control point. The types of structures are illustrated in Exhibit 8.

46. A total of 1,882 acres would be affected by the proposed project. Acreage affected would comprise 575 acres of agricultural land, 690 acres of woodland, and 620 acres of wetland.

47. Federal first costs would be \$23,000,000, and non-Federal costs would be \$1,140,000, for a total cost of \$24,140,000, and an average annual cost of \$1,033,800 (October 1980 price levels, 3-1/4 percent interest). Average annual benefits are estimated at \$1,274,000. The benefit/cost ratio would be 1.23 to 1 (See Table 1A).

#### Environmental Impacts

48. The FEIS contains a complete discussion of the impacts of this alternative (see sections 4.000 and 5.000). A summary of impacts is presented in the following paragraphs. Since all structural alternatives are variations of this plan, the description provided here is more detailed and may be referenced for Alternatives 5, 6, and 7.

49. A temporary but significant increase in turbidity would occur during construction activities. Excavation would introduce silt and clay from the river bottom into the water, making it more turbid than normal. Until the new banks become stabilized by vegetation, greater movement of sediment into the channel would occur than at present. Following construction activities, grasses, brush, and trees would be planted to reduce this impact. Additionally, turbidity may be increased due to channel scour as the modified reaches of the river establish a new low-flow channel within the excavated channel.

50. The proposed project could also modify existing water temperatures. Clearing of riparian vegetation, reducing depth, and increasing the surface area would cause the water to respond more quickly to changes in ambient air temperatures, especially during low-flow conditions. This would result from increased insolation (exposure to sunlight) during the day and increased reradiation (heat emitted as a result of previous absorption) during the night. Seasonal as well as daily temperature fluctuations would be greater



due to these effects. Proposed revegetation plantings would not reduce this impact because the plantings would be further from the channel than the existing woodlands.

51. With increased temperatures, the solubility of oxygen in water decreases. Increased stream temperatures would tend to reduce naturally-occurring oxygen concentrations. Reduced turbulence resulting from the proposed modifications would also tend to reduce oxygen concentrations by reducing contact between air and water. In addition to direct effects on dissolved oxygen (DO), increases in stream temperatures would increase the physiological (respiration) rates of aquatic organisms. This would increase oxygen consumption and could decrease stream oxygen concentrations if turbulent mixing did not fully compensate for the increased demand.

52. Riparian vegetation provides organic matter in the form of leaves and woody debris which forms the energy and food base for the river ecosystem. The river fauna are dependent on this source because, unlike a lake, a river does not produce much of its own energy. In a lake, the large unshaded area of water and lack of water movement allow the lake to absorb sunlight that supports the growth of algae and vascular plants which form the food base. Organic input to support the faunal community would be reduced by approximately 50 percent through the clearing of riparian vegetation along one bank. A reduction in the carrying capacity (ability to support life) of the river would be expected to result from the reduction of the energy/food base.

53. Surface runoff from the watershed contains nutrients (fertilizer residues, etc.) which enter the aquatic system. Nutrients usually identified as potential causes of eutrophication are nitrates and phosphates. Nitrates are leached from the soil fairly readily; phosphates are subject to less leaching loss but are carried on eroded particles.

54. As a result of reduced flooding and shorter contact time between water and soil in the watershed, nutrient additions to the river that directly result from the increased channel capacity would probably be reduced. Indirect effects of the project, however, such as land-use changes and intensified agricultural practices, could actually increase inputs to the river during certain periods. Effects of the enrichment of the aquatic system would be reflected mainly in stagnant water areas such as existing oxbows. Silt and organic material may accumulate in the upstream ends of reaches bypassed during high flow and exert an oxygen demand on the water.

55. Nutrients would be supplied to these areas from surface runoff of adjacent areas. The effect of nutrient additions (enrichment) to streams is not well documented and can vary depending upon factors such as temperature, discharge turbidity, magnitude of inputs, and existing nutrient concentrations in the water. Generally, nutrient additions provide stimulus for the growth of aquatic plants and result in changes in the species of plants present. Along with increased light and temperature due to removal of riparian vegetation, enrichment would encourage the development of aquatic macrophytes and algae, especially in areas of low water velocity. Large standing crops of aquatic plants could exert added demands on the dissolved oxygen during the night as a result of their respiration.

56. The ability of a particular environment to support a wide range of organisms is directly related to its diversity (interspersed) of the habitat types. The quality of the riverine environment depends upon a wide range of physical



and chemical factors and their infinite combinations of interactions. These interactions result in a continuum of more or less discrete habitats that provide the conditions necessary for the support of a diverse assemblage of plants and animals. Important factors that influence the quality of the riverine system are temperature, geology, gradient, land use, and riparian vegetation.

57. The major action of the proposed project, excavating the river channel, would have two immediate effects: (1) to destroy some organisms immediately, such as benthic invertebrates, and (2) to increase the uniformity of habitat along the reach of the river subjected to the construction activities.

58. Modifications associated with this project would cause a significant loss of existing aquatic and terrestrial habitat as well as deterioration of the aesthetic qualities of this reach of the river.

59. The greater uniformity of aquatic habitat would result from the destruction of the existing sequence of pools and riffles. Riffles are typically production areas for invertebrates that provide food for fish, while pools provide cover and resting areas. Eliminating the variability of the channel would decrease the carrying capacity or production potential of the river. Additionally, fish with specific habitat requirements would decline in numbers, allowing an increase in the production of the more tolerant or rough fish species.

#### Measures To Reduce Impacts

60. Several measures were added to the proposed project to reduce impacts or to provide some replacement habitat. (The addition of these measures forms the basis for this supplement.) The choice of measures was limited by the following project constraints:

a. No increase in flows into the Two Rivers basin would be permitted. (A nearly non-existent basin boundary in the Big Swamp area permits flows from the Roseau River basin to cross into the Two Rivers basin during flood periods.)

b. Only moderate increases in flow would be permitted at the International boundary. (These adverse effects have been studied by the International Joint Commission, whose report will provide the basis for negotiations with Canada to determine payments to be made to Canada for mitigation works. These negotiations will result in a signed International agreement which will fix a payment schedule based on this aspect of the project's hydrologic design.)

61. Following coordination of the FEIS, concerns arose regarding the amount of information available to determine impacts on the Roseau River fishery. To allay these concerns and to supplement surveys conducted by the Minnesota Department of Natural Resources (MDNR), the St. Paul District, Corps of Engineers contracted the University of Minnesota to conduct a fisheries survey of the Roseau River in October 1978.

62. In this survey, the project area was divided into reaches based on channel morphology, gradient, and entrance of tributaries. Individual runs within the reaches were selected to provide samples from all representative habitat types within each reach. Fish were collected by pulsed direct current electrofishing (both day and night) and by seining. Observations of water depth and velocity, substrate, vegetation, and cover were made for each run.



63. Game fish comprised 50 percent of the number (walleye 28 percent, northern pike 22 percent) and 53 percent of the weight (walleye 24 percent, northern pike 29 percent) of fish caught by electrofishing. White suckers were the predominant species in the catch (47 percent by number and 42 percent by weight). These results far exceed the statewide average of 14 percent by number and 10 percent by weight for the proportion of game fish in an electrofishing sample. However, the results generally agree with the findings of previous surveys of this fishery conducted by the MDNR. An analysis of the Roseau River fishery has been included in the General Design Memorandum, Supplement No. 2, Appendix A.

64. The numerical catch per effort (CPE), the number of fish caught corrected for the time required to catch them, indicates the general distribution of fish along the length of the river. Northern pike were found in greatest concentrations in and around the Big Swamp south of the Roseau River State Wildlife Management Area, where the river is shallow and has substantial aquatic vegetation (Table 2). The fewest northern pike were found in the furthest downstream reach in the United States near the Canadian border. This reach has a higher gradient than upstream sections and a gravelly bottom with scattered large rocks. The greatest number of walleyes were found in this reach and, to a slightly lesser extent, in the next two reaches upstream. Walleyes were also abundant in the reach below the Roseau Dam which, in some respects, is similar to the downstream reaches previously mentioned. (See Exhibits 2A, B, and C.)

65. The information on distribution and abundance was used to design measures to reduce the project impacts on the fishery.

TABLE 2. CATCH PER UNIT EFFORT (NO /HR.) OF SPECIES COLLECTED BY ELECTROFISHING

Reach <sup>a</sup>	Time <sup>b</sup>	Northern Pike	Walleye	White Sucker	Northern Redhorse	Trout-Perch	Black Bullhead	Carp	Sauger	Total
1	2.33	14.1	31.3	48.0	1.3	3.4	0	0.4	0.4	99.0
2	1.14	13.2	12.3	5.3	0	0	0	0	0	31.7
3	2.26	19.9	24.3	36.2	1.8	1.8	0.4	0	0	84.8
4	3.21	21.8	13.7	31.5	0	0.9	0	0	0	68.0
6	1.16	35.5	4.3	52.8	0	2.6	0	0	0	95.2
7	1.80	23.9	43.9	55.0	0	1.7	0	0	0	124.5
8	0.26	19.0	49.5	194.1	0	0	0	0	0	262.6
9	0.70	5.8	51.8	38.8	10.1	5.8	0	0	0	112.8
Total	12.85	19.9	24.8	41.9	1.1	1.9	0.1	0.1	0.1	89.9

<sup>a</sup>This table omits Reach 5 because it is an oxbow rather than part of the main river channel and it is not accessible by boat.

<sup>b</sup>Actual hours of electrofishing.



### Cutoff Diversion Structures

66. The 11-3/4 miles of river channel bypassed by cutoff channels were originally intended to be plugged to form oxbows. These oxbows would receive water only during spring runoff. Many of the nine reaches would be too deep to provide good waterfowl habitat, but most would also be too shallow to provide fish habitat that would not be subject to winterkill. In the selected plan, however, plugs would be deleted; and a gabion and earth-fill diversion structure would be placed in each new cutoff channel. Normal and low flows would be routed down the existing river channel, and only high flows would pass down the new cutoff. Because approximately 11-3/4 miles of river channel would be essentially undisturbed, existing fish habitat would be preserved in those reaches.

### Elevated Channel

67. The fishery investigations discussed above indicated that the reach from the downstream limit of Big Swamp to the downstream limit of the project (approximately 6 miles) was utilized primarily by walleye. The substrate (glacial till with large rocks) and the gradient (highest in the project area) may be used by walleye for spawning. To protect this area, the proposed plan was modified to leave the low-flow channel undisturbed by setting the lower limit of excavation 2 feet above the channel bottom at its shallowest points (hydraulic controls). In other words, excavation would not disturb at least 2 feet, and usually 3 to 4 feet, of the channel bank and the river bottom. As a result, the channel which contains the river during normal and low flows would remain intact. A wider excavation would, however, be required to provide the same design capacity as the previous plan.

68. The same method of excavation could not be applied to the next upstream reach, the Big Swamp (approximately 12 miles) without increasing the flow into Canada. It would, however, be possible to employ this method for approximately 10 percent of the reach (300 to 500 foot reaches). It was further determined that four reaches of 250 feet each could be left completely undisturbed in the lower 2 miles of the Big Swamp reach. Locations of these reaches are listed in Exhibit 3.

69. Avoiding excavation of the riverbed would eliminate most of the significant impacts of channelization. Turbidity would not increase because of riverbed disturbance since excavation would be dry. A wider land area would be exposed, but proper treatment and revegetation would reduce erosion from rainfall or flooding.

70. Clearing of riparian vegetation would be greater with this excavation method due to the greater width. The river would receive no greater impact since trees shading the river would be eliminated in either case. In addition, the greater clearing may further reduce the organic input to the river but probably not in proportion to the area cleared because trees farther from the river do not provide as much organic input as those on the bank. The impact on wildlife habitat would increase. There would be a greater loss to cavity-nesting waterfowl and upland birds as well as a loss of cover and interruption of dispersal corridors which connect areas utilized by deer and moose.



71. Removal of these woody fringes could therefore adversely affect the populations of upland birds and mammals. The riverward side of the disposal piles, on private land, would be planted with shrubs and trees to replace some of the lost habitat. In those reaches where the project would adjoin public land (MDNR, Wildlife Management Area), the landward side and the top of the disposal piles would be planted following a plan developed by the MDNR and the Corps of Engineers to provide selected types of wildlife habitat.

72. Retaining the existing channel width would reduce the change in the temperature and oxygen regime. Water depth and surface area would remain as they are now and, aside from the lack of shade, would not contribute to increased temperatures or temperature variations. If temperature changes would be less pronounced, dissolved oxygen concentrations would decrease less than with the original channel modification. Also, if the surface area were not increased, aquatic plants and algal growth would not increase.

73. In areas where the channel bottom would not be disturbed, fish habitat would be preserved and the diversity of habitat resulting from large random rocks, different types of substrates, riffles, and pools and eddies would continue to provide a diverse community of plants and animals. Although the proposed plan would still cause impacts on the community, these would be significantly less than in the reaches where the modified excavation method would not be used.

#### Fish Habitat Structures

74. In areas where the raised excavation could not be implemented or could only be provided in small reaches, other measures, such as habitat improvement, would be necessary to reduce the impacts of channel modification. Fish habitat structures were included in the proposed plan to partially replace habitat diversity lost as a result of excavation. A rock and gabion basket wing deflector would be built out into the river. A riprap-lined channel, with random large rocks, would carry the concentrated flow into a rock-lined excavated hole. These structures would be constructed on the inside of bends or at hydraulic control points wherever possible. A total of 58 of these structures would be placed between Roseau Dam (upstream project limit) and the downstream end of the Big Swamp.

75. Tentative locations of the structures were specified by the MDNR. Of the 58 structures located between State Ditch 51 and the Roseau Dam (Exhibit 2), 34 would be located between the upstream end of Big Swamp and the Roseau Dam and 24 in the Big Swamp reach. Sixteen of the structures in the Big Swamp would be located in unexcavated or elevated channel reaches; the rest on bends or at the head of riffles.

76. Several fish habitat structures of varying designs would be installed during the first construction season. The habitat improvement suitability of each design would be evaluated during two subsequent construction seasons, and final design and siting criteria would be developed based on the evaluation. The remaining structures would be installed during the final construction season. This procedure would be necessary because development of habitat in warm-water streams has not been extensively practiced. Experimentation would be used to determine the best designs for fish habitat structures in the Roseau River. A review of the



scientific literature, interviews with experienced professionals, and coordination with the U.S. Fish and Wildlife Service and the Minnesota Department of Natural Resources would be used to develop the preliminary designs, baseline data requirements, and an evaluation plan. Established biological techniques as well as standard chemical methods would be utilized to compare the various designs to baseline and post-excavation conditions in the river. Final designs would be based on the effectiveness of various factors and siting in providing cover, spawning habitat, or forage production for the selected species (walleye or northern pike, depending on location). A report describing the results of monitoring studies and rationale for design selection would be prepared at the end of the study.

77. Although these structures would not replace the large amount of habitat disturbed by construction, they would provide habitat for fish and for their food (algae and invertebrates). The structures would provide habitat diversity by providing a variety of depths, velocities, and substrates to suit the habitat requirements of many types of organisms. The concentration of flow over randomly placed rocks should cause the water to become turbulent. Turbulence aerates the water and would help offset the loss of oxygen caused by temperature increases.

#### Existing Oxbows

78. In the proposed plan described in the FEIS, nine of the thirteen existing oxbows (created by channel modification prior to 1920) would have had permanent plugs placed at inlets and outlets. Downstream plugs would have been solid earthfill, and upstream plugs would have had a flap-gated culvert to allow high flows to enter in the spring. The original plan was reviewed during coordination and was revised to provide a better balance between fish and waterfowl habitat. The selected plan now includes permanent plugs at the inlets of 6 oxbows (2 to 7) and temporary plugs at the inlets of 5 oxbows (1, 8, 9, 10, 11) (Exhibits 2A and 2B). Inlet plugs would be half the bank height at the inlet (Exhibit 6). These plugs would allow water to enter the river during high-flow periods but would prevent sedimentation during and immediately after construction. Permanent plugs would retain water after spring runoff. The plug in oxbow 7 would be placed 225 yards into the oxbow to utilize a natural constriction. Temporary plugs would be removed near the end of the construction period. Low earth-fill plugs with a culvert near the bottom of the structure would be placed at the outlets of six oxbows (2 to 7). The culvert would have a stoplog closure for water control. The design of low outlet plugs would provide water depths suitable for waterfowl production. Water entering during spring runoff would be retained. If desired, the stoplogs could be removed and the oxbow drained to provide suitable conditions for crops which would be used as food for waterfowl, such as wild rice, millet, and smartweed.

79. Existing oxbows without permanent plugs would have temporary inlet plugs to prevent sediment deposition from high spring flows during construction. The plugs would be removed near the end of the construction period. These oxbows would remain available for access by fish seeking spawning habitat and would continue to provide good to excellent waterfowl habitat. Two oxbows (10 and 11) convey the overflow from the Roseau Wildlife Management Area. These oxbows are not elevated above the river channel and have served both as spawning habitat and as access to the waterfowl management pools where substantial northern pike spawning occurs.



#### Side Ditch Outlets

80. The plan evaluated in the FEIS also contained a provision to fix the outlets of ditches entering the river on the excavated bank. This feature was incorporated to prevent erosion by stabilizing ditch outlet banks. During coordination, concerns were expressed about the acreage of wetlands made vulnerable to drainage as a result of project construction since it was generally perceived that channel widening would lower the existing water surface profile. If this occurred, the outlets of some ditches could then be lowered to the new water surface. The deeper ditch could then be extended farther "upstream" in relation to its increased gradient.

81. To prevent project-induced drainage, ditches on the unexcavated bank would be treated the same as those on the excavated bank. Although erosion control would not be required, this treatment would effectively fix hydraulic conditions and, thus, drainage potential, to conditions existing at a predetermined time. Control elevations would be based upon topographic information taken in 1967 and 1974 and upon ditch construction completed by the Watershed District and Minnesota Department of Transportation in 1974, 1972, and 1971.

82. Concerns were expressed that drainage might be increased in spite of fixing the outlets. An analysis of the amount of land that could become vulnerable to drainage was made. Also, additional control measures were evaluated. It was proposed that primary drainage control be provided by installing structures which would restore the water surface to its preconstruction elevation. In effect, hydraulic control of drainage would not change in spite of project construction.

83. A thorough review of the rock-filled gabion profile control structures revealed numerous drawbacks, including high cost, possible isolation of river segments at low flow, potential barriers to fish passage during and after spawning, water quality reductions, interference with boat passage, and increased land clearing and excavation. In addition, many ditch outlets are presently elevated above the water surface and are not controlled by it. For these reasons, the profile control structures were deleted. Fixing the outlets would continue to be the primary means of controlling induced drainage.

84. An analysis was made to determine the amount of land that would be vulnerable to project-induced drainage if controls were circumvented. Information on land use gathered by the Minnesota Land Management Information System in 1969 was updated to 1974, and information current to 1978 was applied where available. Private land not presently under cultivation was placed in one of three categories: pasture and open, marsh (wetland), or forest. In addition, land in public ownership for which the MDNR's proposed disposition was to retain provisionally or to sell was included (300 acres pasture and open land, and 400 acres marsh).



85. Overall, about 22,500 acres of land within the increased limits of drainage would not be considered vulnerable to drainage, including 7,900 acres of public land which the State intends to retain permanently and about 10,000 acres currently under cultivation. About 63 percent (2900 acres) of the remaining 4,600 acres (including 1,900 acres of pasture and open land, 700 acres of marsh, and 300 acres of forest) are presently served by a ditch system. Lands that might become vulnerable to drainage as a result of new ditch construction include 500 acres of marsh, 100 acres of forest, and 1,100 acres of open and pasture lands scattered throughout the basin. Table 3 summarizes the distribution of lands within the increased limits of drainage.

86. For drainage of these lands to become hydraulically feasible, it would be necessary to change the hydraulic conditions at the junction of the drainage ditch and the river in order to allow extension or deepening of the ditches. This change could occur through destruction or alteration of the structure to provide increased capacity or a lower outlet. Excavation of a new outlet could bypass the fixed outlet. However, certain constraints on this activity would result from construction of the project. The local sponsor, the Roseau River Watershed District, would be responsible for project operation and maintenance and would be required to ensure that the project would function as designed. If the amount of water conveyed by the constructed channel increased (e.g., from additional drainage), the design capacity could be exceeded. Stipulations in the local cooperation agreement (to be signed by the Watershed District) would require that ditch outlets not be altered and that no new outlets be constructed. If no outlet alteration would occur, drainage potential would be limited to existing hydraulic boundaries. If the Watershed District also chooses to exercise its legal authority to limit drainage activities, future drainage within existing boundaries is expected to be minimal. If the Watershed District would not exercise its authority, drainage in the watershed would continue to be possible and would be subject to the same limitations that currently exist, including ditch capacity and Federal and State regulations.

87. Impacts of side ditch outlet construction in excavated areas were discussed in the FEIS. Providing side ditch outlet structures on the unexcavated bank would result in disturbance of vegetation and soil when gaining access to the site and during construction. These impacts would be temporary because vegetation would reestablish soon after construction was complete. Since structures would consist of culverts, gabions, concrete sills, and riprap, they would be initially quite noticeable but would become less obtrusive as weathering of the rock and vegetative growth set in. The impacts of side ditch outlet structures on water quality would be minimal and are discussed in the Section 404(b) Evaluation in Appendix B. Typical views are shown in Exhibit 8. A list of all structures and their locations can be found in the General Design Memorandum, Supplement No. 2, available from the St. Paul District, Corps of Engineers.



TABLE 3

ACREAGE WITHIN  
INCREASED LIMITS OF DRAINAGE

A. PRIVATE LAND

In Cultivation = 10,000 Acres

Uncultivated Land	<u>Pasture and Open</u> (1)	<u>Marsh</u> (2)	<u>Forested</u> (3)	<u>All Land Uses</u>
Acres with access to ditch (4)	1,800	300	300	2,400
Acres without access to ditch	<u>900</u>	<u>500</u>	<u>100</u>	<u>1,500</u>
Total Acres	2,700	800	400	3,900

B. PUBLIC LAND

Public Land to Be Permanently Retained = 7,900 Acres

Public Land that Could be Sold (5)	<u>Pasture and Open</u>	<u>Marsh</u>	<u>Forested</u>	<u>All Land Uses</u>
Acres with access to ditch	100	400	0	500
Acres without access to ditch	<u>200</u>	<u>0</u>	<u>0</u>	<u>200</u>
Total Acres	300	400	0	700

C. COMBINED TOTAL: PRIVATE AND PUBLIC LAND VULNERABLE TO INDUCED DRAINAGE

	<u>Pasture and Open</u>	<u>Marsh</u>	<u>Forested</u>	<u>All Land Uses (%)</u>
Acres with access to ditch	1,900	700	300	2,900 (63%)
Acres without access to ditch	<u>1,100</u>	<u>500</u>	<u>100</u>	<u>1,700 (37%)</u>
Total Acres (%)	3,000 (65%)	1,200 (26%)	400 (9%)	4,600 (100%)

Source: MLMIS, Minnesota State Planning Agency

1969 Land use data has been updated using 1974 ASCS photos and has been  
partially updated by 1978 field reconnaissance and telephone surveys.

- (1) Pasture or land with unidentified use.
- (2) Permanently wet, non-forested, vegetated areas.
- (3) Over 10 percent cover of deciduous or coniferous trees.
- (4) Major drainage ditch or stream is no farther than one-half mile away from farthest point of 40-acre plot.
- (5) DNR's proposed disposition: "Retain provisionally" or "sell."



## Cultural Resources

88. Cultural resources investigations have played an integral role in the Roseau River flood control project planning process. The initial reconnaissance survey was undertaken by personnel from the University of North Dakota, Grand Forks, in 1973. The team located seven occupation sites and two mound groups. A supplemental reconnaissance survey was completed by the University of Minnesota in 1974. This survey investigated three site leads obtained from written records. One of these sites, an historic log cabin, has since been destroyed by fire. The University of Minnesota conducted an intensive survey of six sites close to the project area that were located during the reconnaissance surveys. The University of Minnesota archaeologists concluded that three occupation sites would not be affected by the project. They recommended, however, that the Lins Site (21R07) be mitigated and that an historic Ojibwa cemetery at Station 1600+00 and a group of prehistoric burial mounds (the Olson Mound Group) be avoided during construction.

89. The Lins Site was intensively tested by archaeologists from Bemidji State College in 1976. The testing located and recovered the remains of three Archaic campsites and one Middle Woodland campsite. No further archaeological work at the site was recommended.

90. The historic Ojibwa Cemetery will be avoided during construction.

91. The draft of this document states that the Olson Mound Group would be disturbed by the placement of excavated material. It has since been determined that the mounds would be 45-100 feet outside the project right-of-way. Additionally, excavated material would not be placed any closer than 200-300 feet from the mounds.

## Threatened and Endangered Species

92. Amendments to the Endangered Species Act of 1973 were put into effect after completion of the FEIS. As a result, the Corps of Engineers requested a list of threatened (T) and endangered (E) species which might be found in the project area. Following receipt of this list, the Corps prepared biological assessment to evaluate the potential effects of the project on the bald eagle (T), gray wolf (T), and the Arctic peregrine falcon (E). It was concluded that the project would have no effect on those species. Initially, the U.S. Fish and Wildlife Service disagreed with this conclusion (Exhibit 9), and suggested that a bald eagle survey be conducted. Based on field experience and historical records, the Corps of Engineers replied that, in their opinion, a survey was not required (Exhibit 10). The Fish and Wildlife Service concurred but specified that the Corps should continue to be alert for evidence of bald eagles during any field activities (Exhibit 11).



#### Alternative 5: Channel Modification with Bypass at State Ditch 51

93. In an effort to reduce the impacts of the proposed plan on fishery habitat, a bypass channel was investigated. Consideration of this alternative was prompted by the existence of State Ditch 51, which currently passes some excess flow from the lower end of the Big Swamp to a point approximately 6 miles downstream near the lower limit of channel excavation (Exhibit 2A).

94. To use the ditch for flood control, it would require substantial enlargement. The existing ditch has an adequate gradient and alignment but not capacity since it would have to accommodate any flows in excess of bankful in the river channel, including the increase in flows resulting from increased channel capacity upstream. Upstream of the bypass, channel modification and other works would be the same as in the proposed plan.

95. The reach of river which would be bypassed begins at the downstream end of the Big Swamp where the channel gradient increases as the river flows over glacial till. The higher velocities in this reach combined with the rocky riffle substrate provide excellent spawning habitat for walleye. Fisheries surveys have indicated that a substantial portion of the walleye in the project area inhabit this reach. There is also less agricultural development along this reach than upstream, the area is remote from population centers, and the trees are more dense and more mature than those along other reaches of the river. The reach has substantial value for fish habitat, wildlife habitat, and aesthetic quality.

96. This alternative requires acquisition of land from owners not benefiting from the project. Additionally, three new bridges would be necessary, increasing local costs (including real estate) by approximately \$564,000. The local sponsor was unwilling to absorb the increased cost and acquire the required lands. Federal costs for this alternative would be \$572,000 greater than the selected plan. This alternative would have a benefit-cost ratio of 1.18 to 1.

97. Environmental Impacts - The bypass route would affect more land than the selected route because of the necessity to enlarge the small existing capacity of State Ditch 51. Additional acreages required for the bypass would include 75 acres of agricultural land and 20 acres of woodlands. The selected plan would affect 10 more acres of wetlands than the bypass. The preservation of fish and wildlife habitat, wetlands and riparian woodland would more than offset any habitat losses along the State Ditch.

#### Alternative 6: Channel Modification with Levees between Roseau Lake and Big Swamp

98. This alternative would provide a high capacity channel to convey floodwaters without excavating the existing river channel between Roseau Lake and Big Swamp. Essentially, both banks would be raised with materials excavated along the landward side of the levees. A typical levee cross section is shown in Exhibit 3. To provide the required flood protection, levees would be constructed, beginning at the downstream end of Roseau Lake and extending to the



upstream limit of Big Swamp. Channel modification would be used above and below this reach. Levees upstream of this reach would increase flooding in Roseau by backing water upstream of the project area. Levees in the Big Swamp and the lower reach would increase the flows into Canada above the levels agreed to during the study by the International Joint Commission. Changing the flow could require a change in the amount of funds necessary for channel work in Canada.

99. This alternative would affect 510 acres of agricultural land, 610 acres of woodland, and 640 acres of wetland. The total cost of this alternative would be \$26,370,000. Average annual costs would be \$1,125,000, and average annual benefits would be \$1,229,000, resulting in a benefit/cost ratio of 1.09.

100. Environmental Impacts - Levee construction would require clearing a substantial portion of the existing riparian vegetation along both sides of the river. This would result in a substantial loss of existing aesthetic and wildlife values.

101. This alternative would have a moderate impact on the fishery resources. Instream habitat and cover would not be disturbed; and depth, velocity, and substrate diversity would be preserved. However, sedimentation and turbidity would be elevated during construction if high flows or heavy rains occurred. Soon after excavation, vegetation would be planted to reduce erosion.

102. Removal of streambank vegetation would also further increase summer maximum water temperatures above those resulting from channel modification. In conjunction with cooling at night, this increase would result in greater fluctuations in daily temperature. Unlike channel modification, no increase in surface area or decrease in depth would occur; thus, the temperature increase is not likely to be greater than that of channel modification. Oxygen levels would probably not be seriously depleted since retention of instream roughness which causes turbulent flow would allow oxygen levels to reach saturation through reaeration. Oxygen saturation may, however, be at a lower value because of reduced solubility at higher water temperatures.

103. A significant amount of upland game habitat would be removed. The riparian vegetation serves as a corridor for wildlife dispersal and movement into and out of wintering areas. This avenue would be severely disrupted. Waterfowl habitat in wetlands would be disrupted along both banks by levee placement. Waterfowl habitat in the river bottoms (Big Swamp reach) would be undisturbed.

104. Hunting opportunities would be diminished by this loss of habitat, but access to the more remote areas would improve. However, motorized access could cause additional adverse impacts on vegetation and wildlife communities.



105. No impact on threatened or endangered species would be expected to result from implementation of this alternative.

106. This alternative was not selected because the benefit/cost ratio was lower than the selected plan.

Alternative 7: In-Channel Floodway with Channel Modification through the Big Swamp

107. This alternative would involve the construction of a floodway or elevated channel from the Roseau Dam to the upstream end of Big Swamp and from the downstream end of Big Swamp to the downstream project limit. Construction of a floodway through the Big Swamp reach would violate project constraints. The hydraulic characteristics of this type of channel geometry could increase discharges into Canada for flows higher than design flows. Big Swamp acts as a retention area where the outflow through the Roseau River and overflow into the Two Rivers basin is directly related to the water surface elevation. A continuous elevated floodway through Big Swamp could lower the proposed condition water surface elevations for high flows and thereby increase the outflow from Big Swamp. The impact of channel construction on the aquatic ecosystem would be minimized by selecting an elevation 2 feet above the thalweg (the line following the lowest part of the channel) at control points (the shallowest areas). Excavation would reach no lower than 2 feet above the channel bottom and would be greater in most areas (3 to 5 feet). This method could be used in no more than 10 percent of the Big Swamp reach without violating existing project constraints as discussed in paragraph 39. A typical cross section is shown in Exhibit 3 and a perspective view in Exhibit 4.

108. To compensate for the reduction in depth of excavation, channel top width would be increased. The project would affect 940 acres of agricultural land, 730 acres of wooded lands, and 620 acres of wetland, for a total of 2,290 acres. This alternative would cost \$25,760,800. Local (non-Federal) costs would be \$1,636,800. The costs would be higher than the selected plan because three new bridges would be required, although benefits would be the same as the proposed project. The benefit/cost ratio would be 1.16.

109. Environmental Impacts - The excavation and disposal pile required by this alternative would result in a ditch-like appearance of the area above the river channel. However, the visual impacts would differ significantly from those of one-bank channel excavation because the existing river channel would not be altered.

110. No population displacement would result from this alternative, but it would require 365 acres more agricultural land than the proposed project. It would be necessary to clear an additional 40 acres of woodland but no additional wetland acreage would be affected.

111. Construction of an in-channel floodway would have minimal impacts on the high-quality fishery in the Roseau River. Impacts through the Big Swamp reach would be the same as the proposed project. Short-term increases in turbidity and sediment load could result from rain-induced runoff on excavated channel banks. Construction would not ordinarily be in progress during the spring when flooding would be expected. To prevent erosion of excavated areas, vegetation would be planted as soon as possible after excavation. Virtually no excavation would take place in what could be considered a low-flow channel or existing river channel. The majority of instream habitat and cover would be left undisturbed and the diversity of depths, velocities, substrate, and aquatic vegetation types would remain. Existing populations of algae and invertebrates would not be destroyed. No significant shift in species diversity, population size, or carrying capacity would be expected.



112. Although stream temperature changes would result from clearing of riparian vegetation, the increased amount of clearing over channelization would not have additional impact over those discussed for the selected plan. Vegetation immediately adjacent to the bank would have the greatest influence on stream temperature and would be cleared under either plan. However, temperature increases could be significantly less than with channel modification since no widening of the existing low-flow channel would occur. Consequently, decreases in depth and increases in surface area, a combination likely to result in significant increases in temperature, would not occur. The elevated temperature would ordinarily have the primary effect of reducing oxygen solubility in the water. Since the stream bottom would not be altered under this alternative, riffles, large rocks, and fallen trees would cause turbulent flow, insuring that the water achieved near-saturation levels through re-aeration.

113. Recreational opportunities for boating and fishing would be unimpeded, except where water levels were lowered by channel modification in Big Swamp. A slight reduction in waterfowl and upland game hunting would result from loss of habitat through filling of wetlands and clearing of vegetation. The excavated bank and berm would provide improved access and the potential for trail development to hunting areas, thus offsetting some of the lost opportunities.

114. Some would view the improvement of access to Big Swamp as a detriment to the area. Limitation of travel to those on foot would prevent a significant amount of the impacts resulting from improved access.

115. No impact on threatened or endangered species would be expected to result from implementation of this alternative.

116. This alternative was not selected because it had a lower benefit/cost ratio and higher local cost than the selected plan.

#### COORDINATION

117. Extensive coordination with elected officials; Federal, State, and local agencies; and all known interests has been conducted throughout project studies. Because the Roseau River basin boundaries extend into Manitoba, Canada, the International Joint Commission (IJC), a permanent Canada-United States body, has also directed a study concerning a number of questions, including impacts of the proposed project on the entire river basin. In the formulation of this study, the IJC, on 26 August 1971, established the International Roseau River Engineering Board. Members of this board consist of representatives of various Canadian agencies plus Federal and State agencies. This board gathered all pertinent data and undertook complete coordination with State and Provincial agencies as part of its study. Results of the study were presented to the IJC for review in September 1975. The IJC held public hearings in January 1976 and issued its report to the Governments of the United States and Canada in October 1976.

118. The St. Paul District Engineer served on the International Roseau River Engineering Board, and all current information and study results were furnished to the Board throughout the formulation of their report. A task force of the Engineering Board held several public meetings in Canada, prior to the formulation of the Board's coordinated plan and report. In addition, the Board prepared informational pamphlets on the proposed project which were distributed to all known interests in Canada and the United States.



119. The Corps of Engineers has held several meetings with the Roseau River Watershed District throughout the study to ascertain their views and to assure full local coordination and to keep them up to date on studies by the IJC. Various elected officials have also been informed of project developments.

120. In compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, the most recent, June 1980, National Register of Historic Places has been consulted regarding the Roseau River. No property on or eligible for the National Register would be affected by the proposed project. In addition, coordination has been conducted with the Minnesota Historical Society and the National Park Service; and the Minnesota State Archaeologist conducted a contracted survey of the project area. In compliance with Council on Environmental Quality requirements, coordination has been conducted with the Minnesota State Planning Agency and the Northwest Regional Development Commission regarding land use plans.

121. The Corps of Engineers filed an Environmental Impact Statement (EIS) with the Council on Environmental Quality (CEQ) on 13 April 1972. Because of the international ramifications of the proposed project, and because the report by the IJC was not completed, it was not possible at that time to completely assess the mitigation required by the United States to the Canadian Government. Further review and coordination resulted in some modifications of the authorized project to incorporate environmental concerns. Therefore, a more comprehensive impact statement, taking full consideration of the results of the study prepared by the IJC Engineering Board was deemed necessary. A new Draft EIS was filed with CEQ and noted in the Federal Register on 12 September 1975. Following review of this Draft EIS, a Final EIS was prepared. This document was filed with CEQ and noted in the Federal Register on 18 November 1977.

122. The Corps has met often and corresponded with the MDNR and representatives of the U.S. Fish and Wildlife Service (FWS) to discuss various aspects of the Roseau River project. A major concern of both agencies has been the increased drainage potential of lands within the watershed due to modification of the Roseau River channel. Another major issue has been fishery habitat losses that would be incurred by channel excavation. The Draft Supplement to the Final EIS was primarily the result of coordination between the Corps and the MDNR, the FWS, and the National Wildlife Federation concerning features that have been incorporated into the proposed project to mitigate major impacts of the flood control project. Coordination was also conducted with elected officials, EPA, the Izaak Walton League, and the Minnesota Conservation Federation. Appendix C contains many of the letters exchanged during this coordination. Because the large amount of correspondence made reproduction of all the letters and inclosures impractical, this appendix is selective rather than comprehensive, focusing primarily upon letters that deal with issues pertinent to this supplement. The Draft Supplement was distributed to the public, filed with EPA, and noted in the Federal Register on 11 July 1980.



## UNRESOLVED ISSUES

123. In its letter of comment on the Draft Supplement EIS, the U.S. Environmental Protection Agency (EPA) issued a rating of EU-1 (environmentally unsatisfactory--sufficient information). This rating was made because of the proposed placement of excavated material in wetlands throughout the Big Swamp reach. If this were changed to disposal in non-wetland areas, EPA indicated that it would withdraw the unsatisfactory rating, but would continue to have environmental reservations about the project. Alternatives were evaluated, including removal of the 1.29 million cubic yards of excavated material from the Big Swamp. Removal of material by hydraulic pipeline was found to be not feasible because of the extensive distance (5-6 miles) and potential water quality and water supply problems. Removal of the material by hauling would be technically feasible, but would require that a haul road and five temporary bridges be built. Approximately 87 acres would be needed for the road and working areas. This area, 24 percent of that to be protected, would suffer some degree of permanent damage, even after removal of the road. Also, over 210 acres of disposal areas would be covered to a width of 1,000 feet and to a depth of 8 feet with excavated material. The extent of possible changes in productivity of the tillable land is unknown, but changes in soil fertility and consistency could be expected. This alternative would require an additional \$3,368,000 of Federal money and \$88,000 of non-Federal money. The project benefit-cost ratio would be 1.09 if the material is removed. It is felt that the adverse social, fish and wildlife, and monetary impacts, plus a lower benefit/cost ratio, make this alternative less desirable than the selected plan.

In an attempt to resolve this issue, the District Engineer met with the EPA Regional Administrator on 17 November 1980. The Regional Administrator indicated that he would consult with the U.S. Fish and Wildlife Service and Minnesota Department of Natural Resources, as well as conduct a further review within his own agency. The EPA was contacted by telephone on 15 January 1981, because no word had been received from them. They were informed that the position of the St. Paul District, Corps of Engineers, was about to be finalized and had not changed. The Chief of EPA's Office of Federal Activities indicated that the EPA would have no further comment until the final supplement has been completed.

124. Following review of the Draft Supplement, this Final Supplement was prepared to consider the additional comments and questions raised by reviewers. All the letters received during the official comment period are reproduced, along with the Corps responses, in the Comment/Response section of this document.



125. The following agencies, interest groups and individuals were furnished copies of the Draft Supplement for review and comment.

Honorable Rudy Boschwitz, U.S. Senate  
Honorable Dave Durenberger, U.S. Senate  
Honorable James Oberstar, U.S. House of Representatives  
Honorable Arlan Stangeland, U.S. House of Representatives

U.S. Environmental Protection Agency  
U.S. Department of Agriculture  
Farmers Home Administration  
Forest Service  
Soil Conservation Service  
U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
Federal Maritime Commission  
U.S. Department of Energy  
U.S. Department of Health, Education and Welfare  
U.S. Department of Housing and Urban Development  
U.S. Department of the Interior  
Bureau of Indian Affairs  
Bureau of Land Management  
Bureau of Mines  
Heritage Conservation and Recreation Service  
Fish and Wildlife Service  
Bureau of Sport Fisheries and Wildlife  
Geological Survey  
National Park Service  
U.S. Department of State, Office of Canadian Affairs  
U.S. Department of Transportation  
Federal Highway Administration  
Coast Guard

International Joint Commission  
International Roseau River Task Force  
International Roseau River Engineering Board

Canadian Department of Regional Economic Expansion  
Canadian Department of Mines and Natural Resources  
Environment Canada

Honorable Marv Hanson, Minnesota Senate  
Honorable Myron Nysether, Minnesota House of Representatives  
Minnesota Department of Agriculture  
Minnesota Department of Business  
Minnesota Department of Economic Development  
Minnesota Department of Health



Minnesota Highway Department  
Minnesota Department of Manpower  
Minnesota Department of Natural Resources  
Minnesota State Park Commission  
Minnesota State Planning Agency  
Minnesota Pollution Control Agency  
Environmental Quality Council, Minnesota  
Minnesota Recreation and Park Administration Department  
Minnesota Department of Taxation  
Minnesota State Archaeologist  
Minnesota Dairy and Food Commission  
Minnesota Historical Society  
Minnesota State Park Commission  
Minnesota Railroad and Warehouse Commission  
Minnesota Regional Development Commission  
Minnesota Resources Commission  
Minnesota Water Resource Board

Minnesota Association of Conservation Education  
Minnesota Association of Watershed Districts  
Clean Air Clean Water Unlimited  
Minnesota Conservation Federation  
Ducks Unlimited  
Ecological Society of America, Minnesota Chapter  
Minnesota Education Association, Environmental Task Force  
Minnesota Environmental Control Citizens Association  
Minnesota Environmental Education Council  
Minnesota Environmental Education and Research Association  
Minnesota Environmental Education Steering Committee  
Environment Information Center, Inc., New York, New York  
Fresh Water Biological Institute  
Friends of the Earth, Minnesota Branch  
Institute for Ecological Studies, Grand Forks, North Dakota  
Institute for Environmental Studies, University of Wisconsin  
Izaak Walton League of America  
Agassiz Audubon Society  
National Audubon Society  
The Nature Conservancy  
Minnesota Pheasants Unlimited  
Minnesota Public Interest Research Group  
Sierra Club, North Star Chapter  
Soil Conservation Society of America, Minnesota Chapter  
Minnesota Waterfowl Association  
Wildlife of America  
National Wildlife Federation

Kittson County Board of Commissioners  
Kittson County Auditor  
Kittson County Extension Agent  
Kittson County Engineer  
Kittson County Soil and Water Conservation District  
Editor, Kittson County Enterprise



Roseau County Board of Commissioners  
Northwest Regional Development Commission  
Red Lake Indian Reservation  
Mayor, City of Roseau  
Roseau City Council  
City Clerk, Roseau  
City Planning Coordinator, Roseau  
Editor, Roseau Times Region  
Roseau County Auditor  
Roseau County Office of Building Official and Shoreland Administrator  
Roseau County Extension Agent  
Roseau County Highway Engineer  
Roseau County Soil and Water Conservation District  
Roseau River Flood Control Committee  
Roseau River Watershed District  
Superintendent, Roseau River Wildlife Management Area  
Ross - Pinecreek Improvement Association  
Supervisor, Beltrami Island State Forest  
Roseau Electric Cooperative

Rural Municipality of Franklin, Manitoba, Canada

Dr. Kenneth Ames  
Mr. Arnie Bauer  
Mr. John R. Behnke  
Mr. and Mrs. Burton Bergerson  
Mr. Alan Brew  
Brink, Solobik and Severson, Attorneys at Law  
Mr. Robert Dama  
Ms. Denise DeFrates  
Mr. Larry Dobson  
Mr. Al Farmer  
Mr. Robert J. Hall  
Mr. Manfred Holm  
Mr. James Jack  
Mrs. Olga Kuziw  
Mr. Richard Lane  
Major Paul A. Lebo  
Mr. Lloyd A. Ofstedal  
Mr. George Rinde  
Shannon & Wilson, Inc.  
Van Doren - Hazard - Stalling - Schnack Engineers  
Ms. Phyllis Vaughn  
Mr. Garrett B. Voerman  
Miss Clara Watkins  
Yon and Carter, Attorneys at Law



125. Copies of this supplement and the Final EIS have been furnished to the following libraries where they will be held as reference material available to the general public for review:

111 Legislative Library  
State Capitol  
St. Paul, Minnesota 55155

Environmental Conservation Library  
300 Nicollet Mall  
Minneapolis, Minnesota 55401

University of Minnesota Library  
409 Wilson Library  
Minneapolis, Minnesota 55455

University of Minnesota  
Agricultural Library  
St. Paul, Minnesota 55101

Roseau Branch Library  
Roseau, Minnesota 56741

Greenbush Branch Library  
Greenbush, Minnesota 56726

Hallock Branch Library  
Hallock, Minnesota 56728

Red Lake Falls Branch Library  
Red Lake Falls, Minnesota 56750

Morgan Library  
Colorado State University  
Fort Collins, Colorado 80523

Warroad Branch Library  
Warroad, Minnesota 56763

Northwestern Regional Library  
101 East First Street  
Tnief River Falls, Minnesota 56701

St. Paul Public Library  
90 West Fourth Street  
St. Paul, Minnesota 55102

Hill Reference Library  
4th and Market Streets  
St. Paul, Minnesota 55102

Minneapolis Public Library  
300 Nicollet Mall  
Minneapolis, Minnesota 55401



# LIST OF PREPARERS

The following people were primarily responsible for preparing this supplement:

<u>Name</u>	<u>Discipline/Expertise</u>	<u>Experience</u>	<u>Role in Preparing Supplement</u>
Mr. John Shyne	Biology/Fisheries	2 years, aquatic ecology research U.S. EPA, 3 years EIS studies, St. Paul District	Effects on fish and wildlife resources and water quality
Mr. David Miller	Sociology/Social Analysis Studies	4 years, Social Analysis, EIS studies, St. Paul District	Social effects
Ms. Sandy Blaylock	Archeology/Cultural Resource Management	4 years, Cultural Resource Management, University of Arkansas, 6 months, St. Paul District	Assessed project impacts on cultural resources
Mr. Robbin Blackman	Biology/Fisheries, General	11 years EIS studies, Corps of Engineers	EIS Coordinator
Mr. William Slocum	Civil Engineer/Project Manager	22 years St. Paul District, 8 years Water Resources Project Management	Project coordination



**LETTERS of COMMENT  
and  
CORPS RESPONSES**



UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY

REGION V  
230 SOUTH DEARBORN ST  
CHICAGO ILLINOIS 60604

REPLY TO ATTENTION OF  
JER  
75-084-194

DEC 15 1975

Colonel William W. Badger  
District Engineer  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

We have reviewed the Draft Supplement Environmental Impact Statement (EIS) for Flood Control on the Roseau River in Roseau and Kittson Counties, Minnesota. The proposed project includes channel modification within the United States from river mile 93.5 to river mile 137.4 at the Roseau Dam. The project plan also includes remedial work along approximately 10 miles of the river in Canada, extending downstream from the end of an existing floodway.

In our past reviews of the Draft and Final EIS for this project (U.S. EPA comment letters of November 10, 1975 and December 12, 1977), we expressed environmental reservations regarding the project's impacts on wetlands, water quality, and the overall effects to the Roseau River ecosystem. We also asked for additional information to quantify those impacts. The Draft Supplement EIS has adequately assessed the project's environmental impacts and we now find the project to be environmentally unsatisfactory because of significant wetland loss and degradation as a result of the proposed disposal of dredged spoil in 366.1 acres of highly productive wetland. Additionally, we have environmental reservations concerning the potential for the project to degrade the quality of the Roseau River ecosystem. Consequently, we have categorized the proposed project as EU (environmentally unsatisfactory) - 1 (sufficient information). If the disposal of excavated channel material is eliminated from the Big Swamp reach of the project, we would continue to have environmental reservations regarding overall project impacts but we would not find the project environmentally unsatisfactory.

The date and classification of our comments will be published in the Federal Register in accordance with our responsibility under Section 309 of the Clean Air Act to inform the public of our views on proposed Federal actions.

Our comments are attached, and we welcome the opportunity to meet with your staff to discuss them in detail. If you have any questions regarding our categorization procedures or comments, please call Ms. Barbara Taylor of my staff at 312-886-6690 (FIS 886-6690).

Sincerely yours,

*John McGuire*  
John McGuire  
Regional Administrator  
Attachment



Corps Responses to Environmental Protection Agency Comments

COMMENTS BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE DRAFT  
SUPPLEMENT ENVIRONMENTAL IMPACT STATEMENT FOR FLOOD CONTROL ON  
THE ROSEAU RIVER IN ROSEAU AND KITSON COUNTIES, MINNESOTA

Wetlands Loss and Degradation

The impacts on wetlands from actual project construction are very significant. Section 2.a.(2) on page 3 of Appendix B of the Draft Supplement EIS points out that, "Wetland areas receiving fill would essentially change to upland habitat due to the height of the disposal piles. The area to be covered would amount to 366.1 acres." This wetland destruction means the placement of approximately 1,355,777 cubic yards of excavated channel spoil in the Big Swamp reach, approximately 698,824 cubic yards in the Roseau Lake reach, and an additional 84,374 cubic yards in the three mile reach downstream of the lower limit of Big Swamp. The Big Swamp wetlands are highly productive natural lands. These lands provide water quality benefits to the Roseau River, they function as northern pike spawning and nursery habitat, they provide flood control benefits, and they form a major portion of the base of the food web in the Roseau River ecosystem. Aside from the direct impacts of spoil disposal in the Big Swamp wetlands, the reduced period of flooding provided by the project may induce a change in the structure of the floral and faunal communities of this area. Since the change would be to communities tolerant of drier conditions, the present high value of this area as wetland may be degraded. The destruction or degradation of Big Swamp wetlands is untenable in terms of today's environmental standards.

Degradation of Roseau River Ecosystem

The numerous impacts of the proposed channel construction are also of environmental concern. Increases in turbidity would result both from construction activities and from channel scour which would occur as the river establishes a new low-flow channel. Water temperature would be modified as a result of clearing riparian vegetation, reducing depth, and increasing the surface area of the river. Increased stream temperatures would decrease dissolved oxygen concentrations. The removal of riparian vegetation would decrease the amount of allochthonous organic matter, which forms a part of the energy base for the river ecosystem, resulting in a reduction of the river's biological carrying capacity. Excavating the river channel would immediately destroy some organisms, such as benthic invertebrates. This excavation would also increase the uniformity of habitat, reduce the assimilative capacity of the river and, subsequently, reduce the quality of the resource. Although mitigation measures proposed with the project would reduce the severity of habitat impacts, and to some degree water quality impacts, the overall impact of channel construction would result in a significant reduction in the quality of the Roseau River ecosystem.

1. The project is designed to reduce the duration of flooding. However, the retention capability of the Big Swamp would not be altered by the proposed project. Overbank flooding and ground water discharge would serve to maintain the existing structure of the floral and faunal communities of the Big Swamp.
2. We concur. This has been discussed in the supplement and displayed in Table



Corps Responses to Environmental Protection Agency Comments

Environmentally Acceptable Alternative

The primary benefit to be accrued from the project is the protection of agricultural lands from flooding. Past drainage for agricultural purposes, such as the drainage of Roseau Lake in the early 1900's and other land management practices (wetland drainage), have reduced the land's natural flood storage capacity and contributed to the flooding problems endured by the current landowners. The proposed project reduces the scope of the flooding problem by reducing the period of time that water would remain on the land. This results in increasing the crest of the flood waters at the downstream end of the project area. Thus, while the project decreases flooding in upstream areas, it increases flooding in downstream areas (Canada). The project pushes the problem of flooding on to another area instead of correcting the problem where it begins.

A more environmentally acceptable alternative is, ideally, the restoration of the lands natural flood holding ability. This could be achieved by restoring Roseau Lake and, if needed, by retaining additional water in the Big Swamp area. Channelization of the Roseau River would be required between the town of Roseau and Roseau Lake to prevent urban flooding, and minor channel modifications between Roseau Lake and Big Swamp may be required to protect agricultural land there. The environmental impacts of this alternative, as compared with the selected alternative, are reduced proportionately with the reduction in the amount of channelization. Additionally, the impact of the disposal of spoil in the Big Swamp wetlands is eliminated. In our opinion, this alternative minimizes the environmental impacts associated with structural flood control measures for the Roseau River.

We realize this alternative is costly and that it lacks local support. However, as stated previously, we find the selected alternative environmentally unsatisfactory because of the loss of 366.1 acres of wetland. Therefore, if the disposal of excavated channel material is eliminated from the Big Swamp reach of the project (i.e. the spoil is removed from the Big Swamp area in an environmentally suitable manner), we would continue to have environmental reservations with this project based on other impacts, but we would not find it environmentally unsatisfactory.

3. Measures to reduce the impact of flooding in Canada were identified by a board appointed by the International Joint Commission. Funds for the construction of these measures would be transferred to Canada at the completion of negotiations. The estimated amount has been included in project costs.

4. The use of Roseau Lake and the Big Swamp for flood storage was discussed in the supplement in paragraphs 31-35. These alternatives lacked economic feasibility and local support.

5. The elimination of the disposal of excavated material in the Big Swamp has been re-evaluated. The only technically feasible method would be the construction of a haul road and five temporary bridges and removing the excavated material with vehicles. As discussed in Appendix 8, the Section 404(b) evaluation, substantial impacts would result, even if the haul road were removed. Although removing the excavated material would protect the 189 acres required for disposal, 87 acres would be disturbed by placement of the haul road and working areas. In addition, 210 acres of agricultural land would be required for placement of the material. Disposal areas would be covered to a depth of 8 feet with a top width of up to 1,000 feet. The extent of a possible change in the productivity of tillable land is unknown, but changes in soil fertility and consistency could be expected. The additional project cost of removing the material would be \$3,368,000 Federal costs and \$88,300 non-Federal costs. The benefit-cost ratio for the removal of excavated material would be 1.09. It is felt that the adverse social, fish and wildlife and monetary impacts (\$3.4 million increase in construction costs) plus a lower benefit/cost ratio make this plan less desirable than the selected plan.



UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
NORTHEASTERN AREA STATE AND PRIVATE FORESTRY  
370 REED ROAD - BEDFORD, PA 15005  
Telephone (215) 461-3170

1950  
August 4, 1980



William W. Badger, Colonel  
Corps of Engineers  
Department of the Army  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Refer to: NCSED-ER,  
Draft Supplement to the  
Final Environmental Impact Statement  
Roseau River Flood Control, MN

Dear Colonel Badger:

We are concerned about the possibility of the draining of Roseau River Wildlife Maintenance area. Joint efforts by the Corps and the State, through processing of permit applications, should be continued to present valuable wetland areas.

1. By reducing the size of the floodplain, introducing steeper banks, and cleaning the beds of streams, structural flood control measures tend to increase the rate of flow of water. The braking effect of uneven soil surface on gradual slopes is lost. If it is necessary to pass flood waters through the urban areas of Roseau at a faster rate, perhaps the rate of flow could be reduced upstream.

2. If flood waters are allowed to spread temporarily over low areas - including some wetlands - severity of flooding downstream would be reduced, although duration of flooding would be longer.

3. Thank you for the opportunity to review this supplement.

Sincerely,

ROBERT D. WOLFE  
Acting Staff Director  
Forest Insect and Disease Management

Corps Responses to U.S. Department of Agriculture, Forest Service, Comments

1. Construction of the project as designed would have no hydraulic effect on the Roseau River Wildlife Management Area (WMA), and no draining of the WMA would be expected to occur. Thorough coordination has been maintained with the Minnesota Department of Natural Resources, which operates the WMA.

2. Storage of water upstream of Roseau was investigated. However, the topography of the area does not provide suitable sites for development.

3. Refer to Response 4 to comments from the Environmental Protection Agency.





UNITED STATES DEPARTMENT OF COMMERCE  
The Assistant Secretary for Policy  
Washington, D. C. 20230

AUG 21 1962

Colonel William W. Badger  
U.S. Army Engineer District, St. Paul  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Customs House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

This is in reference to your draft environmental impact statement entitled, "Flood Control, Roseau River, Roseau and Kittson Counties, Minnesota." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving eight copies of the final statement.

Sincerely,

*Robert T. Hiki*

Robert T. Hiki  
Deputy Assistant Secretary for  
Regulatory Policy (Acting)

Enclosure Memos from: Mr. Robert B. Rollins  
National Ocean Survey  
NOAA

Mr. Richard E. Hallgren  
National Weather Service  
NOAA





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY  
WASHINGTON, D.C. 20540

AUG 11 1980

OA/C52x6:JLR

Corps Responses to U.S. Department of Commerce, National Ocean Survey,  
Comments

1. No activity is planned which would disturb or destroy geodetic control survey monuments. Should this situation change, the National Ocean Survey would be notified 90 days in advance.

TO: PP/EC - Joyce M. Wood  
FROM: OA/C5 - Robert B. Rollins /  
SUBJECT: DEIS #8007.03 - Roseau River, Roseau and Kittson Counties,  
Minnesota (Flood Control)

The subject statement has been reviewed within the areas of the National Ocean Survey's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments.





U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL WEATHER SERVICE  
Silver Spring, Md 20910

REC'D  
JUL 22 1980

Date JUL 21 1980  
To PP/EC - Joyce Wood  
From OA/W - Richard E. Hallgren  
Subject DEIS 8007.03 Roseau River (Your memo of 7/10/80)

Reply to A of W2:AFF

Corps Responses to U.S. Department of Commerce, National Weather Service, Comments

1. Paragraph 21 has been revised to include this information.
2. We concur. It would continue to be necessary to utilize a flood warning service for the City of Roseau for floods above the level of protection provided by the proposed project.

Flood warning and temporary evacuation means were considered as non-structural alternatives and rejected as not feasible because "Only the most portable personal belongings could be saved."

1. The DEIS failed to mention that the National Weather Service (NWS) presently provides flood forecast service for Roseau, Minn., on the Roseau River. This service emanates out of the NWS office at Minneapolis.

2. The DEIS also should consider a flood warning service as a companion item with any local protection works.

Omission of these items is considered an oversight which should be corrected.

Thank you for the opportunity of commenting on the EIS.



# United States Department of the Interior

OFFICE OF THE SECRETARY  
NORTH CENTRAL REGION  
175 NORTH JACKSON AVENUE  
CHICAGO, ILLINOIS 60604

2A 50/727

August 29, 1980

Colonel William W. Badger  
District Engineer  
U.S. Army Engineer District  
St. Paul  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

The Department of the Interior (USDI) has reviewed the Draft Supplement to the Final Environmental Statement, Roseau River Flood Control Project, Roseau and Kittson Counties, Minnesota. Consolidated comments of various branches of USDI are presented for your consideration.

## GENERAL COMMENTS

- 1 The revised construction plan will not affect jurisdiction of the National Park Service.

- 2 The Draft Supplement briefly addresses the various project alternatives and, for the most part, accurately reflects the environmental tradeoffs which would occur with each alternative. Aside from failing to acknowledge the severe adverse impacts to a 6-acre Type 4 wetland of high value to waterfowl and local wildlife, the document appears to adequately describe impacts associated with the selected project. However, statements that the project will not induce wetland drain <sup>age</sup> should be supported by data, particularly for the reach above Big Swamp.

Opening remarks in the Draft Supplement address watershed landowner perceptions of the project related to potential enhancement of wetland drainage possibilities. The document specifically addresses the type of individual who, perhaps erroneously, believes that the project will extend his effective drainage limits. We are convinced that a significant acreage of undrained wetlands exist in the watershed which are susceptible to drainage without the project. We further believe that the proposed project will promote landowner perceptions of enhanced drainage possibilities for those wetlands and, therefore, inadvertently contribute to such drainage. Additional drainage could (individually

## Corps Responses to U.S. Department of the Interior Comments

1. Comment noted.
2. There is no means of avoiding the wetland that would still allow the eventual construction of a waterfowl impoundment by the Minnesota Department of Natural Resources (MNR). In lieu of avoiding the wetland, an area in the immediate vicinity would be excavated during construction to create a new wetland. The size and configuration would be designed in cooperation with the U.S. Fish and Wildlife Service (FWS) and the MNR to optimize its use by waterfowl. The size, shape, depth, contour, and placement of islands would be planned to provide suitable nesting and feeding areas and predator protection for selected waterfowl species.
3. Fixed side ditch inlets would be installed to limit drainage by maintaining the existing capacity and gradient of the ditches. The amount of land that could become vulnerable to drainage as a result of project construction and illegal circumvention of fixed inlets is discussed in paragraph 85 and Table 3. Land upstream of the Big Swamp reach constitutes approximately 60 percent of the acreage in Table 3.



2

and cumulatively) lead to significant adverse impacts to hydrologic stability, water quality, and fish and wildlife resources of the Roseau River Watershed. Therefore, we support Federal regulatory review of future drainage-related dredge and fill activities as a condition of Federal participation in the project. The only effective means of achieving comprehensive regulatory review, in our opinion, would be through continuing assumption of discretionary authority to require individual 404 permits pursuant to provisions of the Clean Water Act of 1977. If the motives and ambitions of the typical landowner are as portrayed in the opening section of the Draft Supplement, discretionary authority should result in only minor inconvenience to project beneficiaries and review agencies.

# SPECIFIC COMMENTS

## Page 12, paragraph 38

The Plan and Profile data contained in Supplement No. 2 to the General Design Memorandum generally supports statements made regarding a minimum 2-foot separation between hydraulic control points and the elevated channel bottom in the lower 6-mile project reach. However, at Station 58 + 50, one of the identified control points appears to be at or near the level of the elevated channel bottom. Please explain this apparent discrepancy.

With the lower 6-mile reach, the interagency field team (comprised of Corps of Engineers, Fish and Wildlife Service, and Minnesota Department of Natural Resources personnel) identified a hydraulic control point on a river loop in the vicinity of Station 110 + 00. Because it was initially proposed as a channel cutoff, bottom profiles were never determined for that river loop. Subsequently, the cutoff was dropped from consideration. Therefore, we recommend that the level of the elevated channel bottom through the loop be based on the control point near Station 110 + 00 if doing so will cause the elevated channel bottom to be further raised.

## Page 12, paragraph 42

Placement of a continuous disposal pile along the south bank of the river in the reach from the Duxby levee west to Badger Creek for the north dike of a future Minnesota Department of Natural Resources waterfowl impoundment would result in substantial encroachment into a 6-acre Type 4 wetland near Station 860 + 00. Other project features contributing to encroachment into that wetland include construction of an elevated channel at that point and setback of disposal piles from the channel slope. Because of the high waterfowl production capability of this

4. To address the concerns for adverse impacts due to induced drainage, we are providing control by fixing inverts of existing outlets and restraining construction of additional outlets. Thus, a positive physical control of drainage at pre-project conditions is provided. The Board of Managers for the Roseau River Watershed District has been informed that they must exercise continuing judgment on any drainage proposals to ascertain that a ditching project, and more importantly the aggregate of all future ditching, will not cause increased flows in the river which would negate the effect of the flood control project. A discussion on this will be included in the operation and maintenance manual as a continuing reminder to the local sponsor. Awareness by the local sponsor of its liabilities due to damages occurring downstream and in the Two Rivers basin because of altered cross-flows will provide the impetus for local control of drainage. Further, lack of statutory control of drainage which is within the purview of the Minnesota State Government could possibly lead to an action against the State by interests in Canada using the Boundary Waters Treaty of 1909. Thus, the State of Minnesota has an interest in drainage control.

An evaluation of the potential use of discretionary authority in the Roseau River Watershed was conducted because of the continuing concern. The wetlands in a 455-square-mile area were delineated from U.S. Geological Survey 7.5-minute quadrangles. The study area included the area within the Roseau River Watershed District downstream of an east-west line 1 1/4 mile south of Roseau and bounded on the east by a north-south line 9 miles east of Roseau.

Approximately 91,567 acres in public ownership were eliminated from further consideration because their status affords them better protection than could be accomplished under Section 404 of the Clean Water Act. (An estimated 95 percent of this land would be subject to individual permit requirements.)

Approximately 12,010 acres of privately owned land were also subject to individual permit requirements. The most recent aerial photo coverage (1974) available at the time of this evaluation was reviewed. Wetlands which had been converted to crop production were eliminated from further consideration. The remaining wetlands (9,022 acres) were determined to be covered by a nationwide permit. Of these, 3,885 acres were found to be of uncertain status because haying, clearing, or grubbing had taken place. It should be noted that the majority of the wetlands still supporting natural vegetation were bisected by, or close to, existing drainage ditches so that the hydrology of these areas most probably has been altered.

Criteria developed pursuant to EPA guidelines published in 40 CFR 230 were applied against readily available existing data to determine the need to exercise discretionary authority. Available data were of a general non-site-specific nature or, if site-specific, pertained to areas eliminated from further considerations (public lands or lands already subject to individual permit authority). Application of this data in accordance with procedures contained in 33 CFR 323.4-4 does not warrant the exercise of discretionary authority. Should future concerns warrant, the District Engineer would exercise his authority to require individual permits at that time.



Corps Responses to U.S. Department of the Interior Comments

5. The cause of the discrepancy at Station 58+50 is unknown. Field-located control points will be surveyed before plans are prepared. The 2-foot separation would be maintained, as discussed in the GDM and EIS supplement.
6. Bottom profiles will be obtained for the river loop when control points are surveyed. The elevated channel would be adjusted, if necessary, to maintain the 2-foot separation.



3

wetland, we believe all possible steps should be taken to minimize the amount of encroachment into it. By letter of December 13, 1979, the Acting Regional Director, Fish and Wildlife Services, Twin Cities, Minnesota, identified the wetland and recommended that no excavated material be placed there. He also recommended that the Corps consider elimination of the elevated channel segment proposed for Station 839 + 00 to further reduce lateral encroachment into that wetland would constitute noncompliance with Corps Regulations for Implementation of Executive Order 11988 on Floodplain Management (Regulation No. 1165-2-26 dated May 15, 1979). When the Minnesota Department of Natural Resources decides to construct its proposed waterfowl impoundment, the Department of the Interior would support the degree of encroachment into the Type 4 wetland judged necessary for the development and operation of that impoundment.

Page 13, paragraph 4i

Several of the fishery mitigation structures appear to be located in conjunction with elevated channel segments (i.e., Stations 829 + 10, 859 + 00, and others).

Page 13, paragraph 4j

Changes in potential for drainage of wetlands will depend on changes in the low-flow profile of the river and on getaway conditions that exist most of the time, not just during floods. The outlets of the majority of drainage ditches feeding the Roseau River appear to be perched with respect to the normal low water level. Fixing the outlets of those ditches at preproject elevations and capacities would be an effective means of precluding project-induced wetland drainage. However, no information is provided in the Draft Supplement which would indicate that all ditch outlets entering the river above Big Swamp are, in fact, perched with respect to the preproject low water profile. (While many of the ditch invert elevations are shown in Plate 36 of Supplement No. 2 to the General Design Memorandum, there is little useful low water data to which they can be compared). It appears that normal low water elevations may be lowered by several feet in reaches of the project above Big Swamp. For those ditches, if any, whose outlets are presently lower than the low water elevation of the Roseau River, the proposed project would result in enhanced drainage potential. For such cases, we recommend that the "hydraulic control point" be defined as the low water elevation of the river reach in question and that ditch outlet elevations be fixed accordingly. The applicability of these possibilities with regard to the proposed project above Big Swamp should be addressed in the Final Supplement.

7. As stated in response 2, above, excavation and material placement on the south bank would be retained to provide for the eventual construction of the waterfowl impoundment. Elimination of the elevated channel segment would reduce encroachment into the wetland. However, the edge of the wetland basin would need to be reconstructed. Foundation conditions require that material be set back a sufficient distance from the channel to preclude slumping and that the berm be sufficiently wide to support its height. Because of these requirements, a substantial portion of the wetland would still be destroyed.
8. The proposed locations of fishery mitigation structures have been revised to avoid elevated channel segments.
9. There is no engineering term for normal low flows. The low flows would have to be related to a frequency value. Fixing the hydraulic capacity using existing ditch bottom elevations and dimensions would be more objective than selecting a specific low-flow frequency, which would be subject to controversy. Thus, hydraulic control would be determined as discussed in paragraph 8i of the EIS Supplement.



Corps Responses to U.S. Department of the Interior Comments

10. The Draft Supplement was coordinated with the State Historic Preservation Officer. Refer to the response to the SHPO's comments in this appendix.

11. Refer to responses 2 and 7.

12. The paragraph has been revised.

13. The paragraph has been revised.

14. The paragraph has been revised.

4  
Because of the mitigation measures employed within and downstream of the Big Swamp, the low-flow profile will not be lowered significantly in the reach where control for flow from side ditches is the water level in the river, particularly at structures 6-13.

Page 21-23, paragraphs 88-91

The State Historic Preservation Officer (SHPO) should have been contacted to determine whether any of the sites surveyed (pages 21 and 23) were eligible for the National Register. A letter of compliance from the SHPO should be included. The SHPO for Minnesota is Mr. Russell W. Fridley, Director, Minnesota Historical Society, 690 Cedar Street, St. Paul, Minnesota 55101.

Page B-2, paragraph 1.b.(2)

Refer to our response to paragraph #2, page 12. In our view, there is not sufficient justification to place a continuous spoil pile through the Type 4 wetland near Station 860 + 00.

Page B-3, paragraph 2.a.(3)

The first sentence is inaccurate in that it does not address the above-referenced Type 4 wetland.

Page B-5, paragraph 2.c.(1)

The first sentence is inaccurate. Construction of conservation plugs at the downstream ends of oxbows 2 through 7 might cause fill to be placed over varying amounts of year round and seasonal benthic habitat, producing direct effects in benthic communities. The same can be said for placement of dredged material into the above-referenced Type 4 wetland.

Page B-8, paragraph 6.c.(5)

The Corps definition of "project area" appears to be limited to the area undergoing physical alteration. In our opinion, the project area consists of that portion of the Roseau River Watershed which would be influenced by the proposed project. Regardless of which interpretation is more appropriate, there seems little question that filling of Type 2, 3, 4, and 6 wetlands through sidecasting of excavated channel material, contouring and relocation of ditch inlets, and levee construction will have a direct and adverse effect on the water quality maintenance functions of those wetlands.



Page B-9, paragraph 6.d.(7)

- 15 The first sentence does not take into account the perched Type 4 wetland referenced in our comments concerning paragraph 42, page 12. Refer also to our comments relative to paragraph 2.c.(1), page 5-5, above.

Page B-10, paragraph 6.d.(10)

- 16 The Departmental position with respect to the construction of continuous disposal piles through the Type 4 wetland near Station 860 + 00 is set forth in earlier comments concerning paragraph 42, page 12.

CONCLUSIONS

The Department has three principal unresolved concerns with respect to the currently proposed project. They are:

- 17 1. whether a lowered river profile will improve the drainage characteristics of any of the 87 ditches feeding the Roseau River project reach;
- 18 2. what steps the Corps proposes to take to prevent individual or cumulative adverse impacts to the hydrologic, water quality, and fish and wildlife aspects of the post-project Roseau River Watershed; and
- 19 3. whether the Corps is prepared to take steps to minimize adverse project-related impacts to the productive Type 4 wetland identified in previous Fish and Wildlife Service correspondence and referenced at several points earlier in this letter.

In all three cases, recommendations for resolution of those concerns are presented for your consideration. Should you have any questions regarding those recommendations or should you desire to discuss them in greater detail, please contact the Regional Director, Fish and Wildlife Service, Twin Cities, Minnesota.

Sincerely yours,

Sheila D. Minor  
Regional Environmental Officer

15. The paragraph has been revised.

16. Refer to responses 2 and 7.

17. Refer to responses 3 and 9.

18. Coordination has been conducted throughout the development of the proposed project to develop measures to minimize, avoid, or mitigate adverse impacts of the project. Many of these measures that were developed subsequent to the filing of the EIS form the basis for this supplement. These changes are discussed in paragraphs 60 through 87 and include such measures as fixing side ditch outlets, which would maintain existing hydrologic conditions and water quality by limiting drainage. Other measures (including elevated channel reaches, cutoff diversion structures, oxbow plugs, vegetative plantings, and fish habitat structures) were added to maintain or improve the water quality and fish and wildlife habitat of the Roseau River Watershed after construction of the proposed project.

19. Refer to responses 2 and 7.





U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

REGION 5  
18209 Dixie Highway  
Homewood, Illinois 60430

August 18, 1980

IN REPLY REFER TO:

HED-05

U.S. Army Engineer District  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Sir:

Re: NCSED-ER

The draft supplement to the final EIS for the flood control projects on the Roseau and Wild Rice Rivers has been reviewed. Since the additional impact discussion is not transportation related, we have no comments on the supplement.

Sincerely yours,

Donald E. Trull  
Regional Administrator

By: *W. G. Enrich*  
W. G. Enrich, Director  
Office of Environment & Design



FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON 20426

IN REPLY REFER TO:

August 1, 1980

Colonel William Badger  
District Engineer  
Corp of Engineers  
1135 U.S. Post Office &  
Custom House  
St. Paul, Minnesota 55101

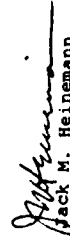
Dear Colonel Badger:

I am replying to your request of June 27, 1980 to the Federal Energy Regulatory Commission for comments on the Draft Environmental Impact Statement for the Roseau Flood Control Project in Minnesota. This Draft EIS has been reviewed by appropriate FERC staff; components upon whose evaluation this response is based.

This staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power, natural gas, and oil pipeline industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Thank you for the opportunity to review this statement.

Sincerely,

  
Jack M. Heinemann  
Advisor on Environmental Quality

Corps Responses to Federal Energy Regulatory Commission Comments

1. Comment noted.



# MINNESOTA HISTORICAL SOCIETY

650 Cedar Street, St. Paul, Minnesota 55101 • 612.296.2747

July 21, 1980

Colonel William W. Badger  
District Engineer/St. Paul District  
Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Attention: Regulatory Functions Branch

Dear Colonel Badger:

RE: NCSED-ER

Draft Supplement for the Environmental  
Flood Control, Roseau River, Roseau  
County and Kittson County.

MHS Referral File Number: L 221

Thank you for the copy of the above referenced report. Pages 21 through 23 describe the cultural resources investigations that have taken place over the past years for the flood control projects. The Olson Mound Group is indicated as the only resources that may potentially be disturbed, if efforts made to redesign the area are not successful. If this is the case, please do not hesitate to notify our office to discuss the eligibility of the mound group and determination of effect.

Again, thank you for your participation in this important effort to protect Minnesota's cultural resources.

Sincerely,

*Ted Lofstrom*  
for  
Russell W. Fridley  
State Historic Preservation Officer

RM7/s1

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## Corps Responses to Minnesota Historical Society Comments

1. Since the publication of the draft supplement, it has been determined that the mounds of the Olson Group would be 45 to 100 feet outside the construction right-of-way. Excavated material would be deposited no closer than 200-300 feet from the mounds. Field work by a Corps of Engineers archaeologist is scheduled for spring of 1981 to verify this determination and to further check the immediate surrounding area for associated habitation material. The preparation of construction plans and contract specifications will be monitored to ensure that sites are noted and specific avoidance procedures are provided. These changes have been coordinated with the State Historic Preservation Officer.



STATE OF  
**MINNESOTA**  
DEPARTMENT OF NATURAL RESOURCES  
CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155

September 23, 1980

Colonel William M. Badger  
St. Paul District Engineer  
U.S. Army Corps of Engineers  
1135 U.S. Post Office and Customs House  
St. Paul, MN 55101

Dear Colonel Badger:

The Department of Natural Resources (DNR) has reviewed the 1980 General Design Memorandum (GDM) Supplement No. 2 and the 1980 Draft Supplement to the Final Environmental Impact Statement (FEIS) on the Roseau River Flood Control Project.

This Department has been involved with this project for many years as required in order to fulfill our responsibilities for assuring the wise utilization and development of natural resources while minimizing the adverse effects on land and water resources. In executing these responsibilities, the DNR is directed by the following laws:

- 1) M.S. 111.02 (1961) states that it is the policy of the state to promote the retention and conservation of all water precipitated from the atmosphere in the areas where it falls.
- 2) M.S. 104.01 (1973) declares that flood plain management ordinances are to be given primary consideration in the reduction of flood damage in Minnesota and that alternative methods for reducing flood damage may not be carried out before adoption of flood plain management ordinances by local governmental units. Further, that structural projects are to be considered only as elements of a comprehensive flood plain management program.
- 3) M.S. 1160.02 (1973), the State Environmental Policy Act, declares that it is the continuing policy of the state to use all practicable means and measures to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of the state's people.
- 4) M.S. 105.41 (1974) states that diversions of water from the state for use in other states or regions of the United States or Canada shall be discouraged.



- 5) M.S. 105.42 (1974) states that a permit shall be granted only when the project conforms to state, regional, and local water and related land resources management plans, and only when it will involve a minimum of encroachment, change, or damage to the environment, particularly the ecology of the waterway. In those instances where a major change in the resources is justified, permits shall include provisions to compensate for the detrimental aspects of the change.
- 6) M.S. 105.42 (1974) further states that no permit affecting flood waters shall be granted except where the area covered by the permit is governed by a flood plain management ordinance approved by the Commissioner and the conduct authorized by the permit is consistent with that flood plain management ordinance; also that no permit involving the control of flood waters by structural means shall be granted until after the Commissioner has given due consideration to all other flood damage reduction alternatives.

The Department also recognizes the local flooding problems and to this end has been working with the Corps of Engineers to develop a project which will minimize these local flooding problems along the Roseau River without producing major adverse environmental effects to the natural resources. The DNR's major concerns with this project have been the potential for induced drainage and the mitigation of adverse impacts to the fish and wildlife resources. These concerns provided the rationale for the fish and wildlife mitigation measures which have been incorporated into the proposed project plan.

In general, the GDM and FEIS Supplements include the measures we previously agreed upon as enumerated in Appendix C of the EIS Supplement. However, certain items in these documents require clarification and consequently provide the basis for this response.

Alternative 1: No Action

1. The EIS Supplement states that flood plain zoning regulations were established by the City of Roseau in 1974. Information about the Roseau County regulations is omitted. The City's action in 1974 was not the adoption of flood plain regulations but rather a resolution of intent by the City of Roseau to participate in the National Flood Insurance Program. The flood plain management regulations developed in accordance with the state-wide minimum standards became effective on October 19, 1978 for the City of Roseau and on January 2, 1980 for Roseau County. While the Supplement correctly identifies that the effectiveness of the regulations for agricultural damage reduction is limited, the involvement of Roseau County should not be understated in the EIS Supplement.



Corps Response to Minnesota Department of Natural Resource Comments

1. Corrections have been made to paragraph 3. Information on Roseau County regulations was inadvertently omitted in the draft supplement, but is included in the final.

2. We concur. The continued need for flood warning, temporary evacuation, and emergency protection is discussed in paragraph 6 of the supplement.

3. Comment noted. The paragraph has been corrected.

4. The basis for using one-bank excavation was primarily to reduce the impact on riparian wildlife habitat (i.e., above the waterline) and aquatic habitat, where possible. The channel side slope at the base of the trapezoidal channel would be excavated only to the extent necessary to make a smooth transition between the trapezoidal channel bottom and the existing channel bank. The bottom of the channel excavation would usually either tie into the unexcavated channel bank, as shown on Exhibit 3 in the EIS supplement, or into the existing channel bottom at some point between the centerline of the existing channel and the unexcavated bank. The typical channel section for one-bank excavation as shown on Exhibit 3 in the Final EIS was misleading because it showed something that would happen at only a few isolated spots along the entire project reach.

5. We concur. Planting of disposal piles in the WMA would be accomplished as suggested and would be fully coordinated with the DNR.

As we have previously emphasized, structural methods of flood control are considered as elements of a comprehensive flood plain management (or flood damage reduction) program. In addition, the permits associated with structural flood control shall not be granted unless the work is consistent with the approved flood plain management ordinances. Local implementation and enforcement of the flood plain management ordinances are primary goals of state policy for all aspects of flood damage reduction. Any redefinition of the 100-year flood plain will be subject to a technical re-evaluation of conditions after project completion; any ordinance amendment requires the approval of the DNR and the Federal Emergency Management Agency (FEMA). It is anticipated that the Corps will provide all necessary analyses and mapping for community flood plain ordinance revisions consistent with state and federal standards.

2. Flood warning, temporary evacuation and emergency protection may be required even with Alternative 4 (the selected plan) if a flood in excess of the design flood occurs. While each such measure is not alone the most desirable alternative, they should all be components of a comprehensive flood plain management program for the entire area.

3. The present acreage of the Roseau River Wildlife Management Area (WMA) is not 20,000 acres as stated on Page 5, paragraph 16 of the EIS Supplement, but rather in excess of 61,000 acres.

Alternative 4: Selected Plan

1. Exhibit 3 in the EIS Supplement shows one-bank trapezoidal channelization, with and without levees, while Exhibit 3 in the 1976 Final EIS shows one-bank excavation only to the centerline of the existing river channel. Paragraph 1.714 (1976 Final EIS) states that "the one-bank excavation concept has the potential for substantially reducing the magnitude of adverse effects on the riverine environment . . . Channel excavation from approximately the centerline of the river to one side retains a portion of the existing aquatic habitat in the river . . ."

We emphasized on Page 8 of our December 31, 1975 letter that excavation from the centerline to one side is important to minimize the loss of in-stream cover. It was our understanding that this aspect of project construction would be retained as a mitigative feature.

2. The EIS Supplement on Page 12, paragraph 40 outlines the proposed revegetation of the disposal piles. Adjacent to the Roseau River WMA, revegetation should consist of alternating quarter mile strips of shrub plantings with quarter mile strips of clover and grass seedings on the riverward slope, the top and the landward slope of the berm.



3. Page 12, paragraph 4) discusses the channel cutoff diversion structures. However, that section does not identify the stage at which the flows will be split between the main channel and the diversion channel.
4. In addition, Page 12, paragraph 4) discusses the disposal pile for the future waterfowl impoundment in the Badger Creek area. As indicated, for a waterfowl impoundment the disposal pile should run from Badger Creek to the west side of Section 22, T 163 N, R 43 W. However, Exhibit 28 shows the disposal pile ending on the south side of the river below Oxbow #10. The disposal pile should be extended about 0.8 mile west to the east side of Section 21, T 163 N, R 43 W.
5. Page 13, paragraph 4) describes the outlet water control plugs. The plug on Oxbow #7 should be located about 225 yards landward from the river. The temporary inlet plugs (as Page 19 indicates) should refer only to Oxbows 1, 8, 9, 10 and 11. The inlet plugs on Oxbows 2-7 (as Exhibit 6 of this GDM Supplement indicates) will be permanent to manage the water levels of these oxbows.
6. According to the text of both the 1980 GDM and EIS Supplements, to protect the reach from the downstream limit of the Big Swamp to the downstream project limit, the elevated channel bottom is designed to be approximately 2 feet above the existing channel bottom at each of the selected low-flow control points. On the basis of project modifications, the elevated channel should be 2 feet above the control point at Station 58+50 which would also improve the height of the elevated channel above the existing channel at about Station 38+00.
7. Plates 8 through 22 in the GDM Supplement No. 2 show that the proposed trapezoidal channel would generally be level with or up to 2 feet below the existing channel. The control points should negate the possibility of improving lateral drainage in the Big Swamp area. However, many of the upstream stations between 1000+00 and 2300+00 in Table 1 on Page 3 of the 1976 Final EIS appear to be deeper in Plates 13-22 of the 1980 GDM Supplement. Lowering the river bed in this manner would be expected to increase the secondary drainage capability of adjacent lands. Excavation should occur at the design depths by which Table 1 of the 1976 Final EIS was generated.
8. In addition, Page 19, paragraph 7) discusses the oxbows that would remain available for use by fish. The water levels of these oxbows presently provide good to excellent waterfowl habitat so no water control structures are necessary. If the control points are not completely effective and the river bed is lowered to any extent, it could have a highly detrimental effect on the wildlife value of these oxbows. As long as water levels remain approximately the same as they are now, these oxbows can provide valuable habitat for fish and wildlife.

6. The height of these structures above the respective design thalweg ranges from 3.9 to 7.3 feet. These heights were based on channel geometry restrictions, headloss at the design flow, and the hydraulic characteristics of the structure. Estimates of the magnitude of low flows maintained within the old loops indicate diversions of up to approximately 500 cubic feet per second before the cutoff channel would begin to function.

7. Comment noted. The exhibit has been corrected.

8. We concur. Paragraph 4) has been clarified.

9. Refer to responses 5 and 6 to the U.S. Department of Interior letter.

10. Excavation would occur at the design depths used for Table 1 of the Final EIS. The table showed the difference between proposed excavation and the thalweg (line connecting the deepest points of the existing channel). Plates 13-22 of the GDM and its supplements compare the excavated channel bottom to the ground line at the centerline of the proposed channel. The thalweg is not shown. While Table 1 shows the change at the deepest part of the channel, the plates in the GDM show changes in areas of lesser depth and, in some cases, dry land. Thus, the bottom elevation in Table 1 and the GDM plates would be the same, but is compared to different channel features.

11. Comment noted. The paragraph has been revised.



Colonel William W. Badger  
September 23, 1980  
Page Five

Project Economics

In the DNR review of the 1975 Draft EIS, we noted that the Benefit/Cost (B/C) ratio was 1.6 based on a federal interest rate of 3%. Table 1 on Page 11 of the 1980 EIS Supplement states that the B/C ratio of Alternative 4 (the selected plan) is now 1.23. The June 1980 Red River of the North, Roseau River Subbasin Report stated that the present B/C ratio in that document for the Roseau River Flood Control project is .89. Which information is correct?

We are also unclear whether the 3% interest rate continues to apply or whether reauthorization at a more current interest rate is necessary as a result of project modifications.

Federal Wetland Authority

The DNR letter of May 29, 1979, indicated to Colonel Gay that one method to minimize the potential for secondary drainage is for the Corps of Engineers to assume discretionary Section 404 jurisdiction over important wetland complexes or basins capable of being drained. Your correspondence of August 9, 1979 indicated that while the decision was subject to change, discretionary jurisdiction would be exercised.

Appendix B of the 1980 EIS supplement contains the Section 404 evaluation of the project. It is not specified in the Appendix whether the Corps will assume jurisdiction as indicated by previous correspondence. The DNR's regulatory authority is limited to Type III, IV and V wetlands of 10 acres or more in unincorporated areas. Since many of the wetlands in the Roseau River basin are Types II and VI, it is important that the Corps exercise jurisdiction over the dredging and filling of these important wetlands to further minimize the potential for secondary drainage. If the Corps will not assume jurisdiction over additional wetland drainage, easements to prevent drainage of additional lands should be considered by the project sponsors prior to final project approval.

The Department of Natural Resources is completing the preparation of the state Draft EIS as required by M.S. 116D.04. As previously stated, aspects of the project not related to fish and wildlife mitigation measures will be addressed in that document. The DNR looks forward to continued cooperation with you and members of your staff towards the furtherance of this project.

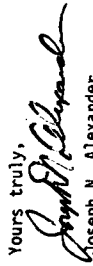
12. The correct benefit/cost ratio is 1.23.
13. The 3% interest rate would continue to apply.
14. Refer to response 4 to comments from the U.S. Department of the Interior for a discussion of this aspect of the proposed project. Since the acquisition of easements would be a local responsibility, the project sponsor has been informed of your comment.



Colonel William M. Badger  
September 23, 1980  
Page Six

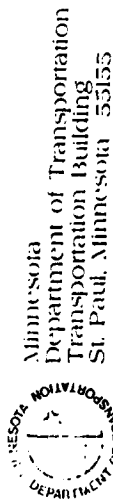
Please contact my office if you have any questions regarding these comments.

Yours truly,

  
Joseph M. Alexander  
Commissioner

cc: Kermit McRae  
Representative Myron Nysether  
Senator Marvin B. Hanson  
Howard Degerness  
Steve Thorne  
Yonny Hagen  
Charles Burrows  
Larry Seymour  
Merlyn Westoh





Corps Responses to Minnesota Department of Transportation Comments  
1. Planned channel changes adjacent to the Highway 310 bridge would be coordinated with the Bemidji District Office.

002 294 3000

August 14, 1980

Colonel William W. Badger  
District Engineer  
St. Paul District Corps of Engineers  
1135 United States Post Office and Custom House  
St. Paul, Minnesota 55101

Re: Flood Control on the Roseau River,  
Roseau and Kittson Counties  
Environmental Impact Statement Supplement

Dear Colonel Badger:

The Minnesota Department of Transportation (Mn/DOT) has reviewed the Supplement to your Environmental Impact Statement (EIS) for a Flood Control Project on the Roseau River for Roseau and Kittson Counties in Minnesota.

While there appears to be no direct impact on state transportation systems, we offer the following comments for your consideration.

Our concern centers upon the 430 foot bridge on State Highway 310 over the Roseau River north of Roseau. The bridge was built to a length greater than that normally required because of the problem of bank stability along the river. Even with this precaution, movement has occurred within the bridge structure.

For this reason, we recommend that any plans for channel changes immediately adjacent to the bridge be discussed with Steve Baker, Preliminary Designer Engineer at Mn/DOT's District Office in Bemidji, phone number (218) 755-3336.

Any other questions or requests for additional information may also be directed to Steve.

Sincerely,

Richard P. Braun  
Commissioner



THE IZAAK WALTON LEAGUE OF AMERICA  
INCORPORATED

August 7, 1980

Colonel William H. Badger, District Engineer  
St. Paul District Corps of Engineers  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Re: Draft Supplement To The Final Environmental Impact Statement - Roseau River Flood Control Project

Dear Colonel Badger:

As I pointed out in phone conversations with Bill Slocum and Bob Post on Wednesday, the 6th of August, there are several objections to material presented in the Draft Supplement on this project.

Primarily that I'm talking about are the comments made on pages 3, 4, 5.

I realize that this social information is as a result of the alternative number 1, known as the no action alternative, and according to Bob Post is consistent with the kind of social impact information encouraged by new EIS guidelines promulgated by CEQ. I've not seen those guidelines, and I doubt that those guidelines would encourage putting in an EIS item that can only be referred to a speculative, hearsay, and personal opinion. I would imagine that what the CEQ was trying to develop was a discussion of the social impact of a project or project alternative along the same fundamental principles guiding the rest of the parts of the EIS, and that is a factual description of the project, its benefits, its costs, its impact on the environment, on the economic scene, and on the social scene, as well as alternatives to it.

I see no room in it for the kinds of comments found on the pages referenced above, because the material presented is totally unbalanced, if one is to interview and get personal opinions from some project beneficiaries, then one has to get interviews from and personal opinions from people representing different attitudes and even people who are opposed to the project that reside in or out of the area. That type of approach almost promises an endless round of interviews, opinions and rebuttals and does seem to me to be worthwhile or consistent in anyway professionally with what that type of document should provide.

Let me make a few comments, again these were shared with Bob and Bill, but to specify let me turn to the document itself with the following comments:

On Page 2, Paragraph 9, there is reference to the drainage in the watershed in Canada and that that drainage is expected to continue whether or not a project is implemented. That's about the same kind of discussion you have with one of your children when you ask them to clean their room and they object indicating that their sister or brother hasn't cleaned his or her room. I hear it often when we're dealing with pollution abatement problems, when one company charges that another company is doing a much or worse polluting. It seems to me that such a discussion here that the damage from Canada should be assessed and dealt with between the two countries,

Corps Response to Izaak Walton League Comments

We have revised the Final Supplement to provide more support for the conclusions in the Draft. This should allay some of your concerns as to the "speculative" nature of pages 3, 4, and 5. In general, however, the topics discussed and conclusions made in the Draft are also in the Final Report. We do not agree that the information presented is "...speculative, hearsay and personal opinion..." or that it is "...unfair because it is imbalanced..." In response to your specific comments, we believe your objections can be summarized into the following major points: (1) that opinions do not constitute impacts and should not be reported as such; (2) that only one side's opinions are presented; (3) that any impacts resulting from local reaction to the no action alternative are irrelevant to plan selection and should not be considered or reported; and (4) the portrayal of local agricultural interests overestimated their actual concern with, or commitment to, natural resources.

In response to the first point, we disagree with your statements. Perceptions, particularly voiced perceptions (what you refer to as "opinions"), do in fact determine human actions, which in turn result in real impacts. People make decisions to act, and direct their actions, according to their perceptions of reality. This is not unique to the local agricultural interests. The environmental interests involved in the Roseau River study perceive certain results from the implementation of a project. The accuracy or inaccuracy of their perceptions is an issue unrelated to the consequences (e.g., your action of responding to the Draft Supplement). The actions you take, in support of your perceived interests and your perceptions of plan results, are real actions and have real impacts regardless of the accuracy of the perceptions which led initially to your action. In other words, the content (not accuracy) of your perceptions determines the manner in which you act. We are not suggesting that the accuracy of either interest's perceptions is unimportant, but we do contend that questioning their accuracy is irrelevant to the issue of what impacts will result from actions taken upon those perceptions.

In addition, we fully support the research technique used to gather this information. Key informant interviewing is a legitimate and powerful social science technique for reporting majority public opinion and predicting future action. The validity of this claim can be supported scientifically; and, indeed, qualitative research methods such as this have been shown in many cases to have both greater predictive power and validity/reliability than many of the research techniques used in the "hard" sciences. The only question of merit in denouncing our use of key informant interviewing, is whether we actually reached the key informants of the area on this issue. We believe that the expanded discussion in the Final Supplement provides sufficient support to answer this question affirmatively.



# THE IZAAK WALTON LEAGUE OF AMERICA

- 2 -

the Roseau River Flood Control Project should be judged on its merits alone.

Again, the speculation in paragraph 10 regards relationships between American farmers and Canadian farmers due to the necessity to build dikes in the event of no alternative is speculative, and inconsistent with the need to measure the project itself and its benefits and costs.

I would skip on to paragraph number 19 on page 5, which indicates that individuals might withdraw from "positions of key responsibility for conservation", et cetera, generally indicating that if the project doesn't go through they may no longer feel that it is proper for them to be stewards of their own resources, that they might actually have an anti-attitude, et cetera.

While one certainly understands there might be a possible personal reaction in disappointment over a project not being completed, I don't think it has anyplace in the draft supplement.

Along the same lines, I have no doubt that many of the people that live there are exactly what some of those paragraphs portray, that is good farmers, good citizens, a concern at least to some degree with the environmental setting in which they or their families maintain a permanent residence. On the other hand, historically even the most casual observer of agriculture and land use, would have to realize that in the OVERWHELMING majority of cases, the farm community does to land what opportunity and economic necessity demand. Given changes in circumstances, there is no assurance with or without the project that there will not be further conversion from natural areas to intensified agriculture in Northwestern Minnesota and any suggestions to the contrary are purely speculation. Farming has like the rest of the business community in the United States considered it necessary to function primarily for efficiency, productivity, and profitability, not for the retention of the natural environment. There are some exceptions to those statements but generally they are not accurate. Witness the soil erosion problems in the Mid-America state in 1950 that are in excess of the soil erosion problems on prime farm lands back in the so-called dust bowl days. This last statement is a fact documented by soil scientists in universities and in the UG3 so I do not make that statement on the basis of personal opinion or speculation.

I conclude where I began, the people up there are certainly sincere and well intentioned people, but such kind of commenting does nothing but weaken the Draft Supplement. It is unfair because it's unbalanced and does not permit other opinions to be a part of the Draft Supplement, but neither kinds of opinions have any place in such a document. The social impact treatment should be the same as the other project descriptions and that is the general factual discussion of the impacts on the social magnitudes and the social attitudes an setting, and not personal opinion and speculation.

Sincerely,

David F. Zentner, Executive Board Chairman  
Izaak Walton League of America, Inc.  
224 First National Bank Building  
St. Cloud, Minnesota 55802

## Corps Responses to Izaak Walton League Comments

Because we believe the second objection, that only one viewpoint was presented, is partially valid, we have changed the report to incorporate more of the opposing perceptions. However, we stress that the purpose of the presentation was to identify the salient factors affecting public perception and behavior in the project area and to indicate probable changes in the social system. The discussions on pages 3, 4, and 5 do identify and discuss the major issues which will affect the future conditions of Roseau County.

The third issue raised in your letter was the contention that local reactions resulting from implementation of an alternative are irrelevant to plan selection. We believe this is inaccurate. First, the purpose of the Corps project is to satisfy local need within the parameters of Federal guidance and policy. Local perceptions, and their consequent behavioral results, are obviously important indicators of our effectiveness in accomplishing this. In addition, the anticipated behavioral reaction of people to a particular alternative is as valid a consideration in plan selection as the anticipated reaction of an ecological system to that same alternative.

Finally, we disagree with your fourth major point, that the environmental awareness and concern of the agricultural community was exaggerated in the report. Roseau County's achievement in preserving its natural areas, as discussed in paragraph 15, speaks in support of the presentation. We certainly agree that the farming community functions as a business: farming and agricultural support services are the principal forms of livelihood for Roseau County residents. However, your suggestion that maximizing economic return is their sole objective, to the uniform detriment of natural interests is, we believe, a faulty conclusion. Orientations of this type, on the part of all of the interests involved in the Roseau River project, are non-productive, and may serve to aggravate present conflicts between the multiple users of the natural and human environments of Roseau County.



Corps Responses to Izak Walton League Comments

1. Refer to response 4 to comments from the U.S. Department of the Interior for a discussion of this aspect of the proposed project.

September 30, 1980

Colonel William W. Badger, District Engineer  
United States Army Corps of Engineers  
St. Paul District  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Re: Roscoe Project

Dear Colonel Badger:

I received a copy recently of the letter that Patrick Parenteau of the National Wildlife Federation, regarding comments on the Supplemental EIS.

I agree with his comments completely regarding the unreasonableness of your reasons for not exercising discretionary authority under Section 404 of the Clean Water Act and the matter of requiring permits for dredge and fill activities.

His point that the burden belongs on the landowners who if the project is completed, will be generously rewarded by a substantial Federal subsidy.

I don't think anyone active in wetlands protection has much faith at all in the fact that field reviews by your agency, or other agencies, and the process that is triggered if drainage difficulties are encountered, are any substitute for requiring dredge and fill incentives to notify the administering agencies.

Sincerely,

*David F. Johnson*  
David F. Johnson, Chairman Executive Board  
Izak Walton League of America, Inc.  
824 First National Bank Building  
Duluth, Minnesota 55802





## NATIONAL WILDLIFE FEDERATION

1412 Sixteenth Street, N.W., Washington, D.C. 20036 202-797-6800

September 25, 1980

Colonel William W. Badger  
District Engineer  
U.S. Army Corps of Engineers  
St. Paul District  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Re: Roseau Project - Comments on Supplemental EIS

Dear Colonel Badger:

I am writing to again urge you to take more positive action to protect the wetlands lying within the boundaries of the Roseau River Flood Control Project. We understand that the project has been designed to minimize, in a physical sense, the risk of secondary drainage into the channelized river. However, we fail to understand why the Corps continues to balk at exercising its discretionary authority under Section 404 of the Clean Water Act to require permits for dredge and fill activities in these wetlands. The arguments we have heard against the exercise of this authority are unpersuasive. If there is in fact "no problem" with respect to wetland drainage, then there is no reason (including administrative burden) not to exercise this authority. On the other hand, there is good reason to serve notice on landowners now that 404 permits will be required for dredge/fill-type activities in these wetlands. Serving notice puts the burden where it belongs--on the landowners to apply for a permit, rather than on the Corps to discover potential illegal activities. This burden is a small price to pay in exchange for the generous federal subsidy represented by this project.



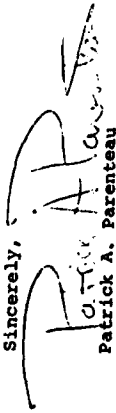
Col. William W. Badger  
September 24, 1980  
Page 2

Corps Responses to National Wildlife Federation Comments

1. Refer to response 4 to comments from the U.S. Department of the Interior for a discussion of this aspect of the proposed project.

1. In short, Colonel Badger, the National Wildlife Federation feels that exercise of your discretionary 404 authority is an essential mitigation measure for this project.

Sincerely,



Patrick A. Parenteau  
Director  
Resources Defense Division

PAP:ks

cc: Leonard Hockert, Pres., Minn.  
Conservation Fed.  
Ken Hiemenz, Alt. Rep., MCF  
Wayne Baron, Reg'l Exec., NWF



Corps Responses to Comments from Vernon Erickson

1. As discussed in paragraph 81, page 20 of the draft supplement EIS, control elevations of certain ditches would be based on construction completed by the Watershed District and Minnesota Department of Transportation in 1974, 1972, and 1971. The outlet structures would be sized to accommodate the capacity of upstream culverts.

Redger Minn  
Aug 15 1980  
Dept of the Army  
St. Paul District Corp of Engineers  
1135 M. S. Post Office  
St. Paul Minn 55101  
Dear Colonel Redger

attention 700 SED-ER.  
The Roan River Flood Control  
Project.

In regard to Capacity of Culverts  
through the Redger River and  
Nashville and serving as  
outlets into Roan River for  
Roan River Watershed District  
ditch installation.

There is a need of course  
that the Capacity and function  
of these ditches not be changed  
through a restriction in Culvert  
Capacity or grade as these  
ditches outlet into the Roan  
River.



An indication of the size of  
Culverts needed. Would be the  
size of ditch Culverts through  
Rocum County State aid road #10  
located near the Rocum River  
and running parallel to it.

These ditches serve a need  
to the prime agricultural land  
in the area and there would  
be an unfavorable impact on  
these lands if adequate  
outlets for these ditches  
referred to are in any way  
impaired -

Thank you

Vernon Erickson



507 Fourth Ave. N.E.  
Roseau, Minnesota 56751  
August 5, 1980

Col. William W. Badger  
District Engineer  
Corps of Engineers  
1155 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Col. Badger:

My purpose in writing this letter is to bring you my comments on the Draft Supplement, E.I.S.; Roseau River Flood Control Project. First, though, I want to compliment the personnel of your department for a long and dedicated effort put forth to arrive at a solution to the damaging floods which often plague the people in the Roseau River basin. Over the years, your work and ours, at times, has been very frustrating.

The E.I.S. Supplement has been reviewed by myself and I noted with interest the comprehensive studies carried on over the years. I am in agreement with the proposal designated as alternative A, which involves channel modification as the most feasible and practical plan to achieve the desired goals. With the many restraints placed on this project, it is very clear that not all the concerns of the various interests can be met. I believe that an honest effort has been made to reduce the undesirable impacts of the project to a level we can accept by inclusion of a number of construction features which will make the project more acceptable to a wide range of interests.

Among the features I believe to be especially important are one bank excavation which will leave at least half of the channel undisturbed, and thus preserve much of the present vegetation along the river. Reestablishment of grasses, legumes, and shrubs on the disturbed areas following construction will be important in the control of erosion and prevention of soil pollution. In addition, this practice will provide abundant food and cover for wildlife.

Other features which have been proposed, such as the construction of an elevated channel at selected points and the treatment of oxbows and cutoffs will appeal to certain individuals and groups interested in the Roseau River project. This practice should be of special interest to environmental groups.

There have been serious objections voiced by some, in an effort to delay or kill the Roseau River Flood Control Project. Many of these objections have been raised by persons who will be neither benefited nor damaged by the project. Most do not reside in the watershed. In fact, the majority of criticism leveled against the project has been from groups and individuals outside the county--from the Twin Cities Metropolitan area and southern Minnesota. Some of what has been presumed to be local opposition is from residents and property owners in the Roseau River watershed, who presume that the overflow from the Roseau River into two rivers will somehow be worsened by the project. Some of these live in Roseau County, but the majority are in the area to the west of Roseau County. This spirit of mistrust has existed over a long period of time, and has proven to be a situation nearly impossible to overcome.

In conclusion, the overwhelming majority of the people who reside in the Roseau River watershed favor construction of the proposed project as modified. These folks take a dim view of outside influence which has been exerted to delay or kill the project for which they have labored over a period of more than 40 years.

Very Truly Yours,

Copy to:  
Roseau River Watershed District

Harold Grothem

Corps Responses to Comments from Harold Grothem

1. Coordination has been maintained with all interested parties and agencies throughout this project to ensure that all valid concerns were adequately addressed.
2. Habitat for certain species would be enhanced by vegetation plantings in the Roseau River Wildlife Management Area. Refer to response 5 to the letter from the Minnesota Department of Natural Resources.
3. The construction of elevated channel reaches and the treatment of oxbows and cutoffs, as well as the placement of fish habitat structures, would reduce the significant adverse impacts to the aquatic community.
4. We appreciate your concern with resolving the difficult flooding problems of Roseau County. As the agent of the Federal Government, the Corps has the objective in the Roseau River project to help eliminate flood-induced damages in the area, in a manner consistent with the guidelines for providing local assistance. Because we represent the Federal interest, however, we have an additional obligation to consider the concerns of the national public. The process we use to reach decisions on how to allocate Federal resources for solving local problems must, therefore, allow a free and open hearing to all interested citizens, regardless of where they live.



Bulge, Minnesota  
Aug 46 - 1980

Corps Responses to Comments from Melford E. Nelson  
1. Please refer to the response to the letter from Mr. Vernon Erickson.

Dear Sir:

In regard to the Roseau River Project enlarging  
deepening & limited straightening of the Roseau river  
channel and construction of levees through certain  
areas on southside of the channel.

I recommend the be adequate culvert size through  
the levee where there are drainage ditches entering  
Roseau river channel. Areas which the drainage  
ditches serve is agriculture farming land and -  
dependent only on drainage of this type.

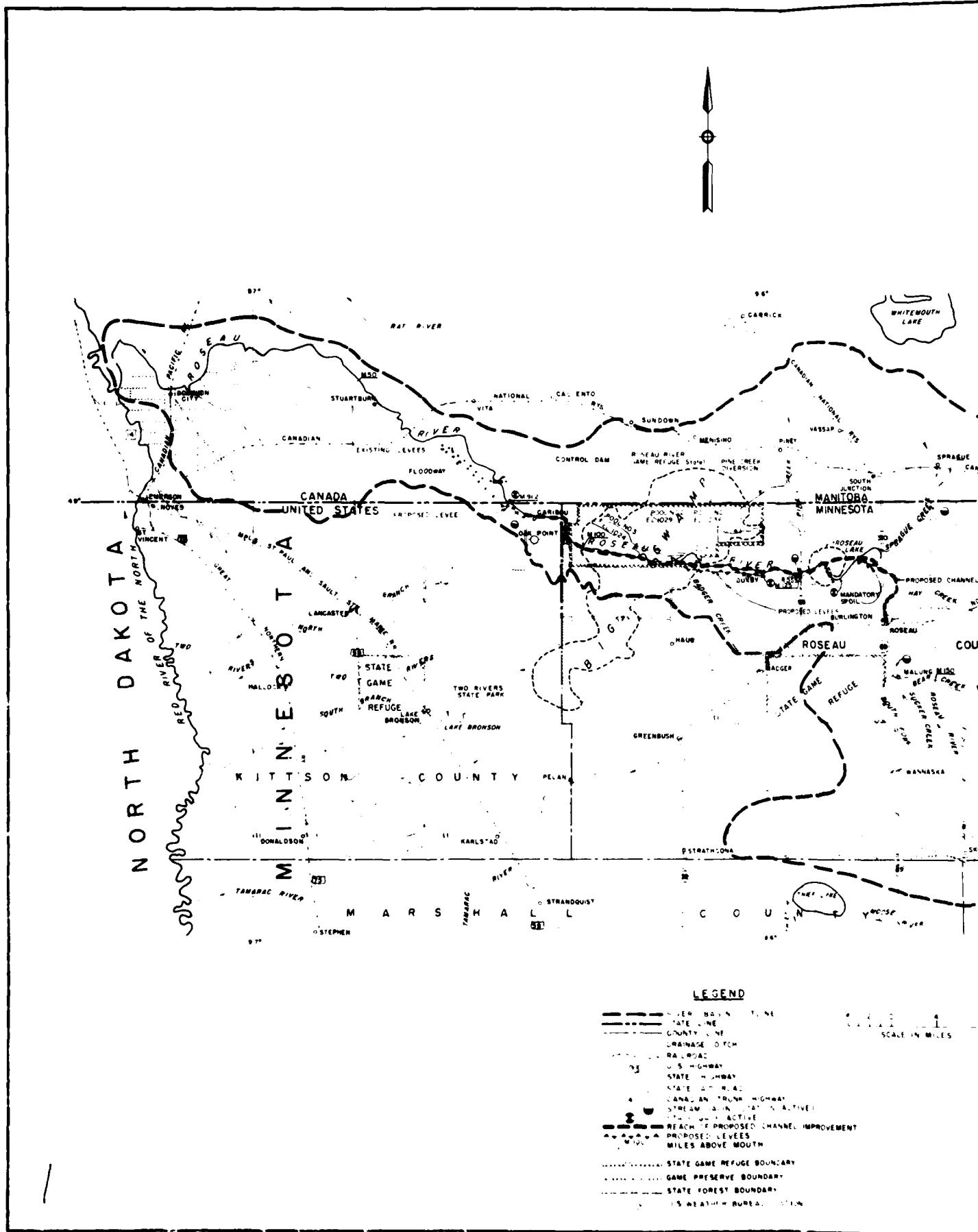
As a farmer myself and landowner I am much concerned  
and ask this be looked at very carefully and come  
up with best result possible.

Melford E. Nelson  
Bulge, Minnesota

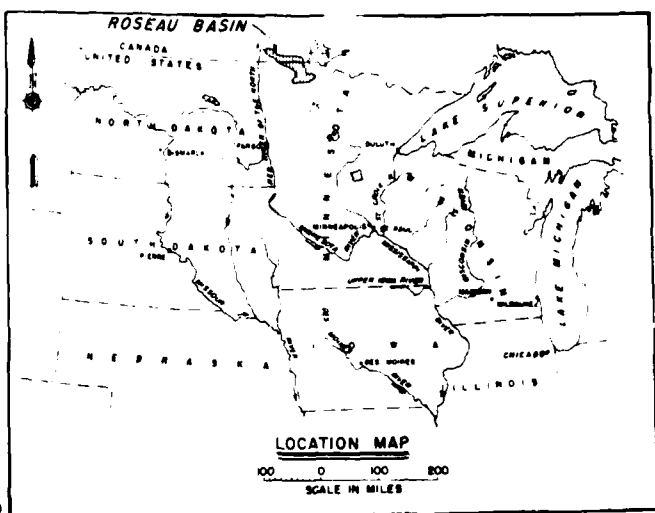
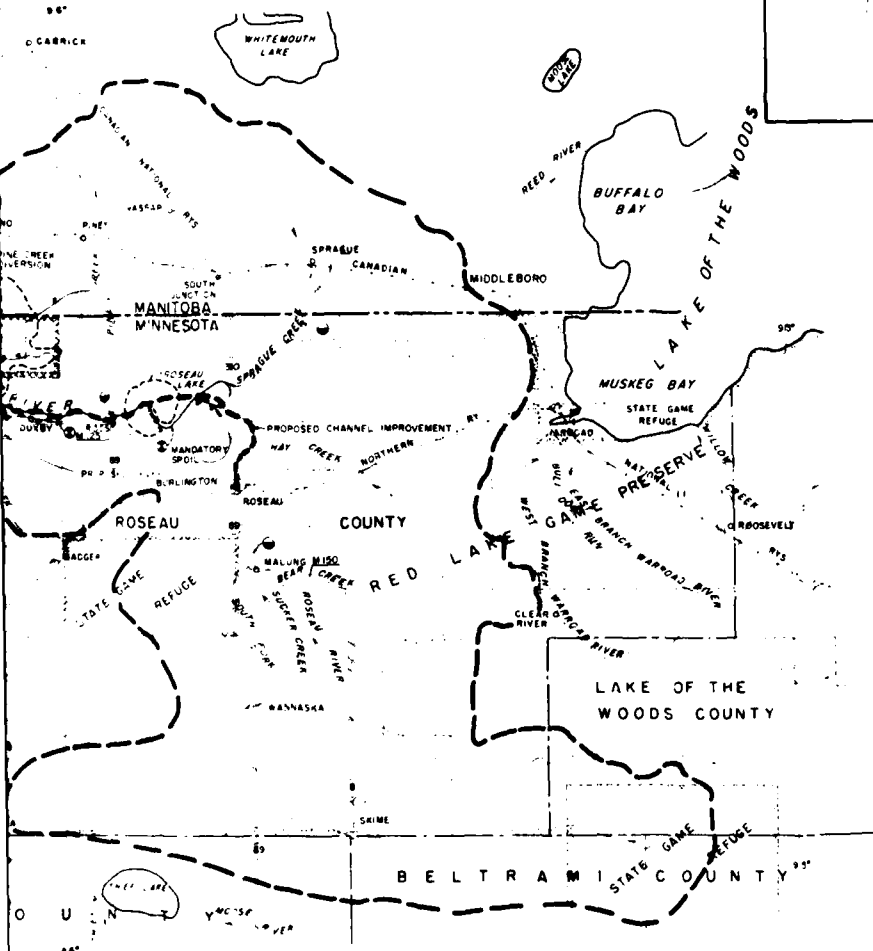


**APPENDIX A**  
**EXHIBITS**









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 LINE NE  
 1 2 3 4 5 6 7 8 9  
 SCALE IN MILES  
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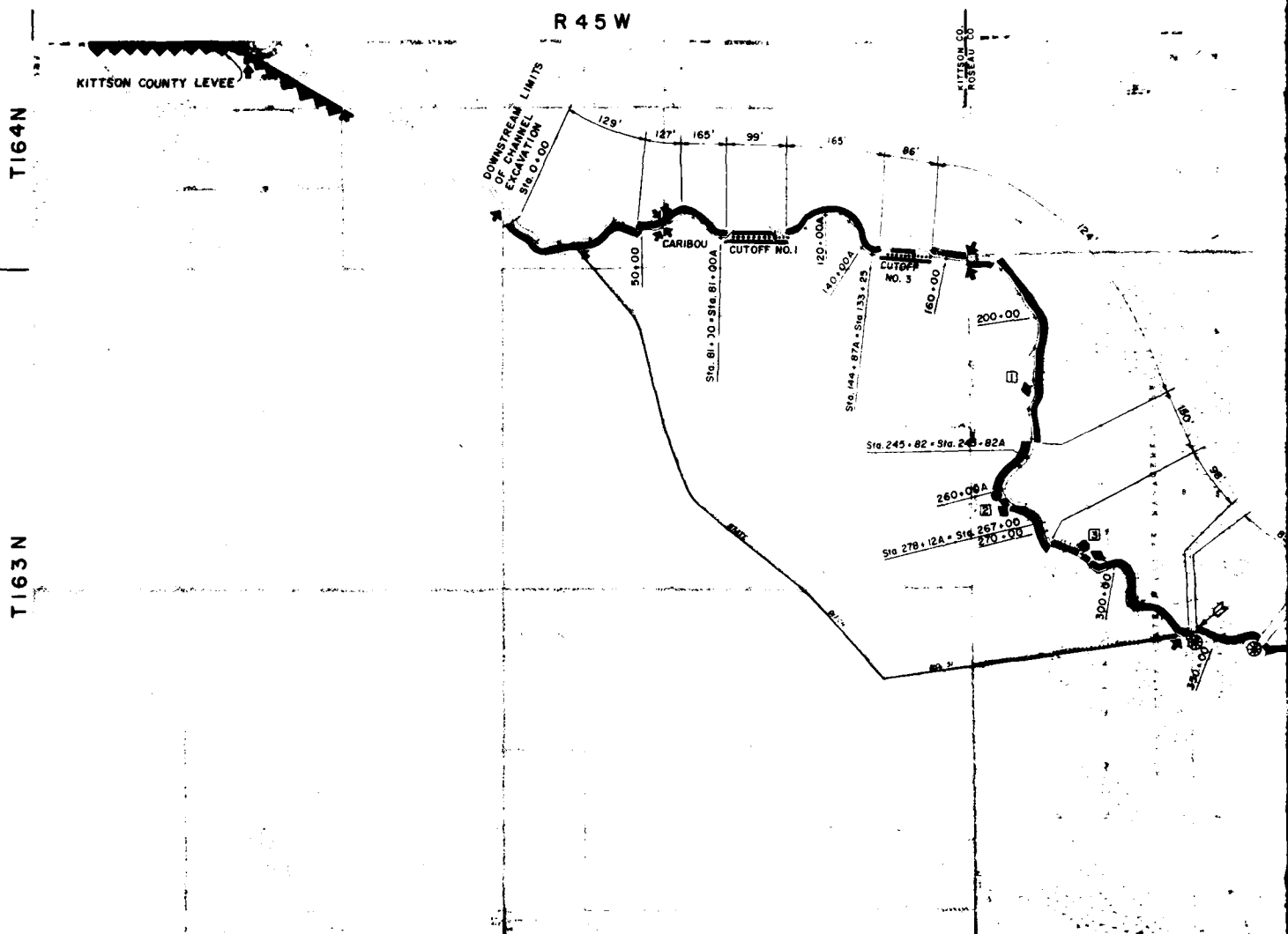
2



SYMBOL		DATE		APPROVAL	
DEPARTMENT OF THE ARMY ST. PAUL DISTRICT CORPS OF ENGINEERS ST. PAUL, MINNESOTA					
DESIGNED BY		GENERAL DESIGN MEMORANDUM			
DRAWN BY		FLOOD CONTROL			
CHECKED BY		ROSEAU RIVER, MINNESOTA			
SUBMITTED BY		GENERAL MAP OF BASIN			
APPROVED		SUPPLEMENT 2		MAY 1980	
DRAWING NUMBER		DRAWING NUMBER			
SHEET		SHEET			

EXHIBIT I

















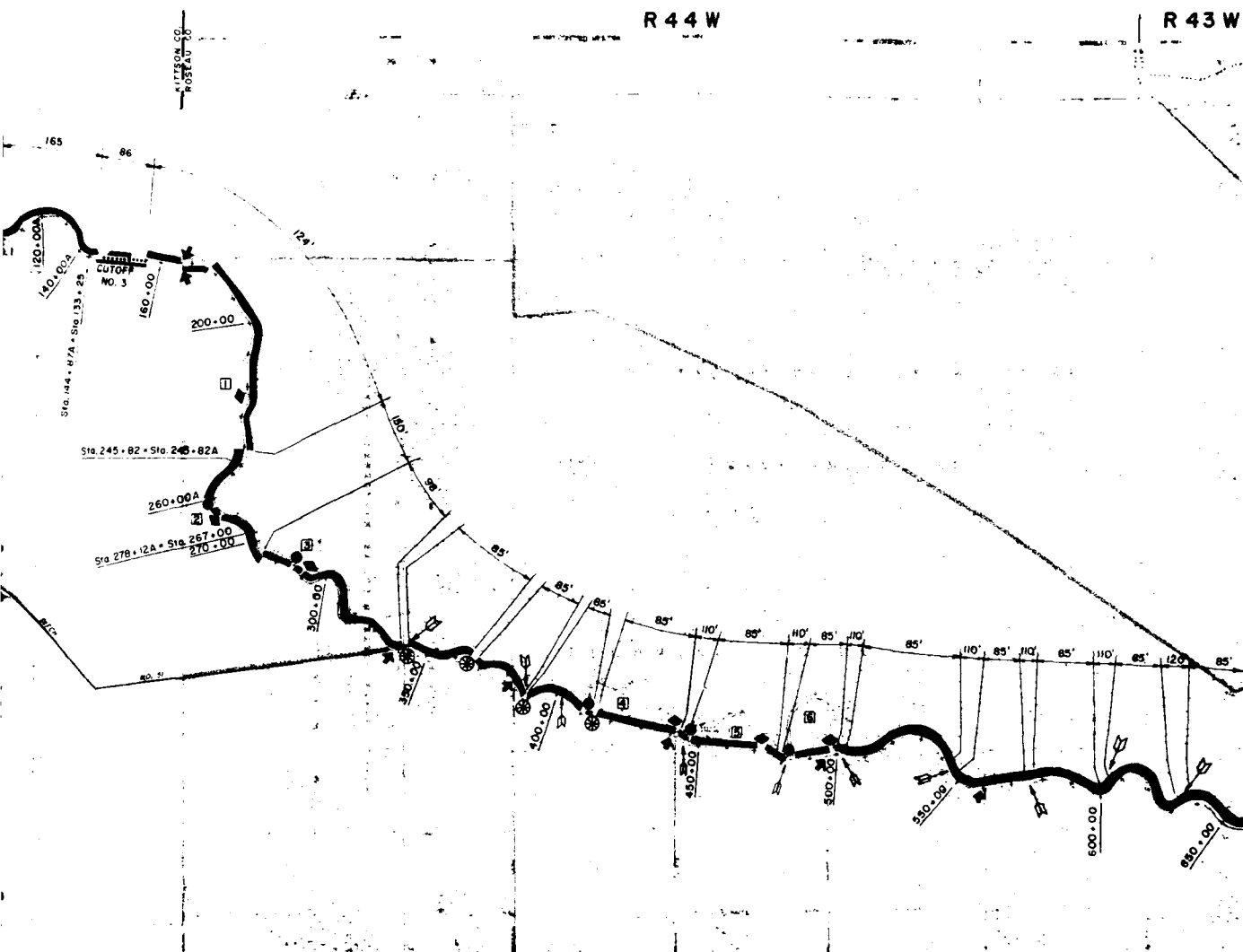
# **PROJECT ALIGNMENT**

MILE 91.2- MILE 106.0  
ABOVE MOUTH

## **LEGEND**

- |   |   |   |   |
|---|---|---|---|
|  | DOWNSTREAM CONSERVATION PLUG<br>SEE EXHIBIT 6 FOR DETAILS |  | UNEXCAVATED CHANNEL REACH<br>SEE EXHIBIT 3 FOR DETAILS          |
|  | UPSTREAM CONSERVATION PLUG<br>SEE EXHIBIT 6 FOR DETAILS   |  | EXISTING OXBOW NUMBER<br>SEE EXHIBIT 6 FOR DETAILS              |
|  | PLUG EXISTING CHANNEL<br>SEE EXHIBIT 6 FOR DETAILS        |  | NEW EXCAVATED CHANNEL BOTTOM WIDTH<br>SEE EXHIBIT 3 FOR DETAILS |
|  | NEW CUTOFF CHANNEL  |  | FISHERY MITIGATION STRUCTURE<br>SEE EXHIBIT 7 FOR DETAILS       |
|  | CUTOFF DIVERSION STRUCTURE<br>SEE EXHIBIT 5 FOR DETAILS   |  | LEVEE<br>SEE EXHIBIT 3 FOR DETAILS                              |
|  | MODIFIED DITCH INLET<br>SEE EXHIBIT 8 FOR DETAILS         |  | SPOIL DISPOSAL AREA<br>SEE EXHIBIT 3 FOR DETAILS                |





# **PROJECT ALIGNMENT**

MILE 91.2- MILE 106.0  
ABOVE MOUTH

ED CHANNEL REACH  
EXHIBIT 3 FOR DETAILS

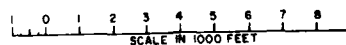
OWBOW NUMBER  
EXHIBIT 6 FOR DETAILS

IVATED CHANNEL BOTTOM WIDTH  
EXHIBIT 3 FOR DETAILS

MITIGATION STRUCTURE  
EXHIBIT 7 FOR DETAILS

EXHIBIT 3 FOR DETAILS

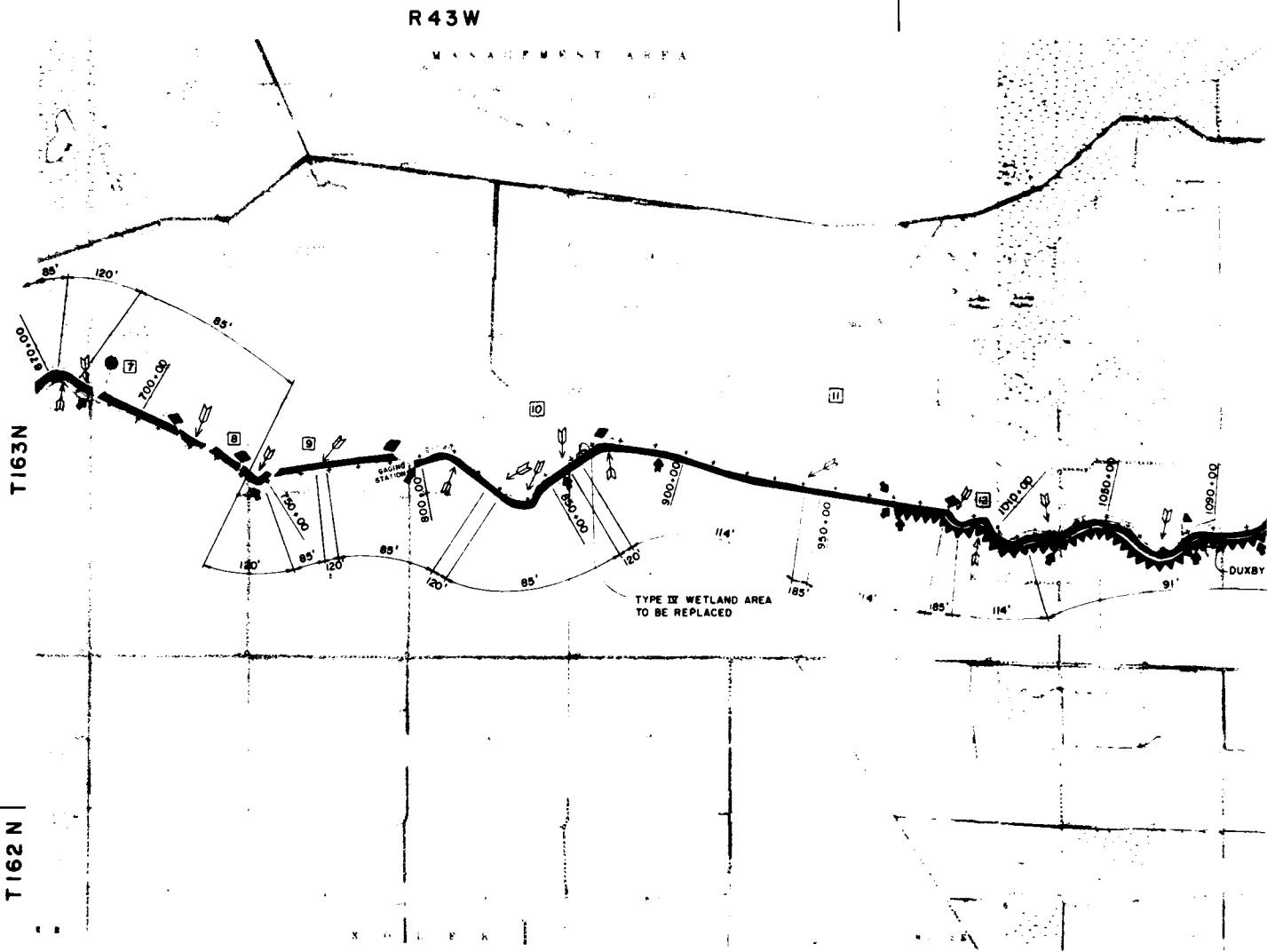
POJAL AREA  
EXHIBIT 3 FOR DETAILS



GENERAL DESIGN MEMORANDUM  
ROSEAU RIVER, MINNESOTA  
PROJECT ALIGNMENT

EXHIBIT- 2A



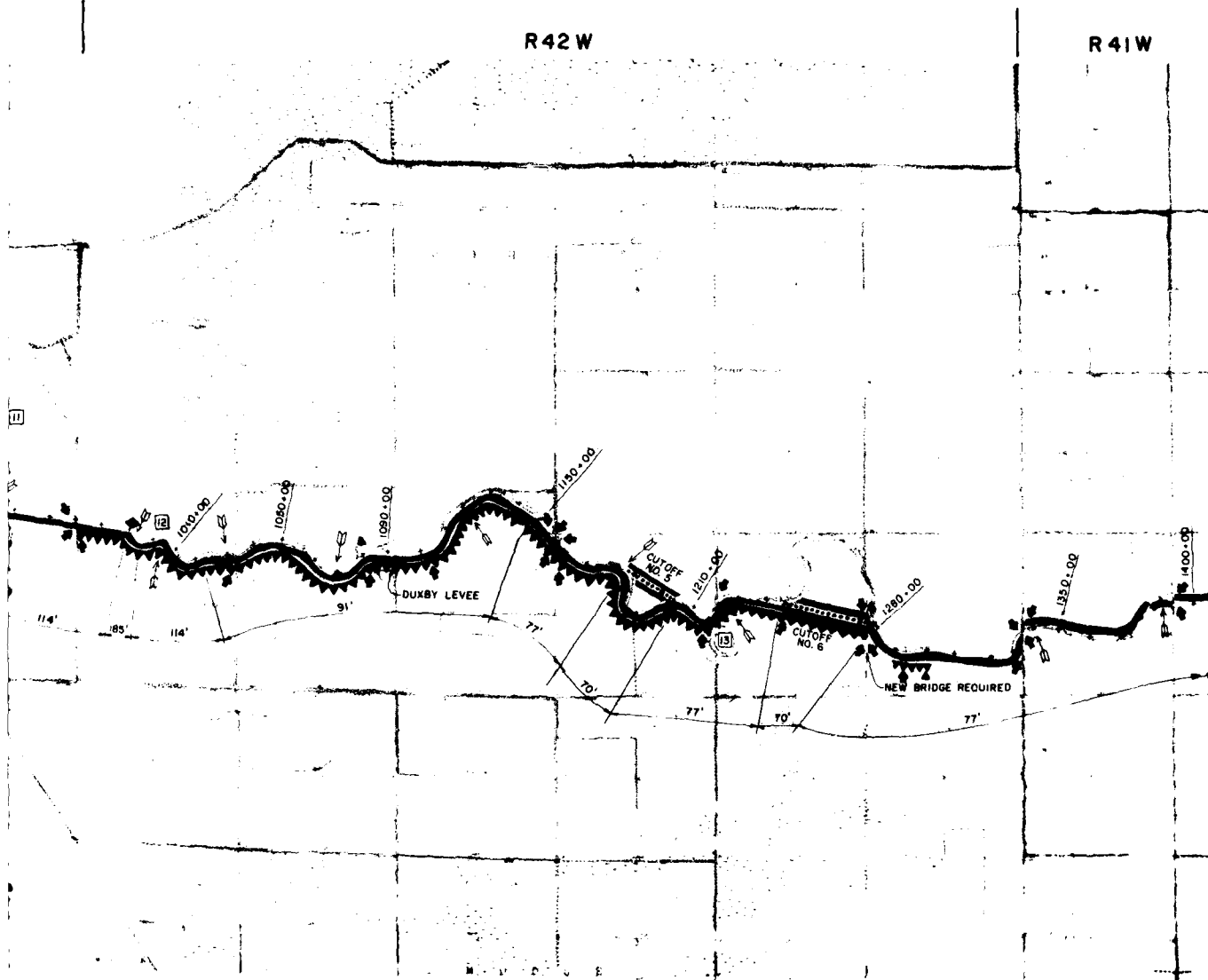


**PROJECT ALIGNMENT**  
 MILE 106.0 - MILE 120.1  
 ABOVE MOUTH

**LEGEND**

- |  |   |  |   |
|--|---|--|---|
|  | DOWNSTREAM CONSERVATION PLUG<br>SEE EXHIBIT 6 FOR DETAILS |  | UNEXCAVATED CHANNEL REACH<br>SEE EXHIBIT 3 FOR DETAILS          |
|  | UPSTREAM CONSERVATION PLUG<br>SEE EXHIBIT 6 FOR DETAILS   |  | EXISTING OXBOW NUMBER<br>SEE EXHIBIT 6 FOR DETAILS              |
|  | PLUG EXISTING CHANNEL<br>SEE EXHIBIT 6 FOR DETAILS        |  | NEW EXCAVATED CHANNEL BOTTOM WIDTH<br>SEE EXHIBIT 3 FOR DETAILS |
|  | NEW CUTOFF CHANNEL  |  | FISHERY MITIGATION STRUCTURE<br>SEE EXHIBIT 7 FOR DETAILS       |
|  | CUTOFF DIVERSION STRUCTURE<br>SEE EXHIBIT 5 FOR DETAILS   |  | LEVEE<br>SEE EXHIBIT 3 FOR DETAILS                              |
|  | MODIFIED DITCH INLET<br>SEE EXHIBIT 8 FOR DETAILS         |  | SPOIL DISPOSAL AREA<br>SEE EXHIBIT 3 FOR DETAILS                |





# **PROJECT ALIGNMENT**

MILE 106.0- MILE 120.1  
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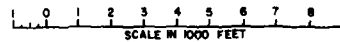
NUMBER  
FOR DETAILS

ANNEL BOTTOM WIDTH  
FOR DETAILS

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FOR DETAILS

FOR DETAILS

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FOR DETAILS



## GENERAL DESIGN MEMORANDUM ROSEAU RIVER, MINNESOTA PROJECT ALIGNMENT

EXHIBIT- 2B

2

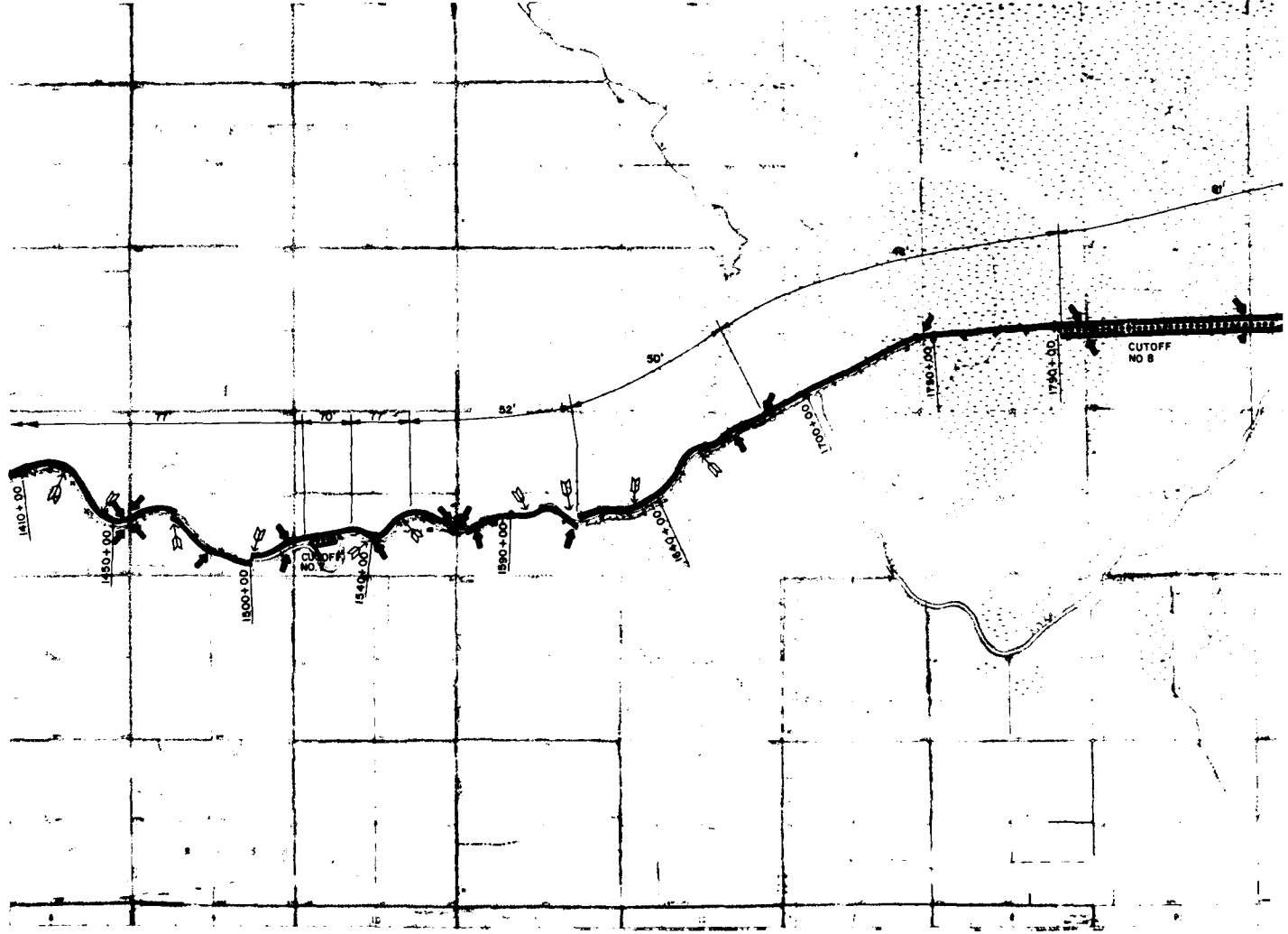


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### PROJECT ALIGNMENT

MILE 120.1-MILE 137.4  
ABOVE MOUTH



### LEGEND

- DOWNSTREAM CONSERVATION PLUG  
SEE EXHIBIT 6 FOR DETAILS
- UPSTREAM CONSERVATION PLUG  
SEE EXHIBIT 6 FOR DETAILS
- PLUG EXISTING CHANNEL  
SEE EXHIBIT 6 FOR DETAILS
- NEW CUTOFF CHANNEL
- CUTOFF DIVERSION STRUCTURE  
SEE EXHIBIT 5 FOR DETAILS
- MODIFIED DITCH INLET  
SEE EXHIBIT 6 FOR DETAILS

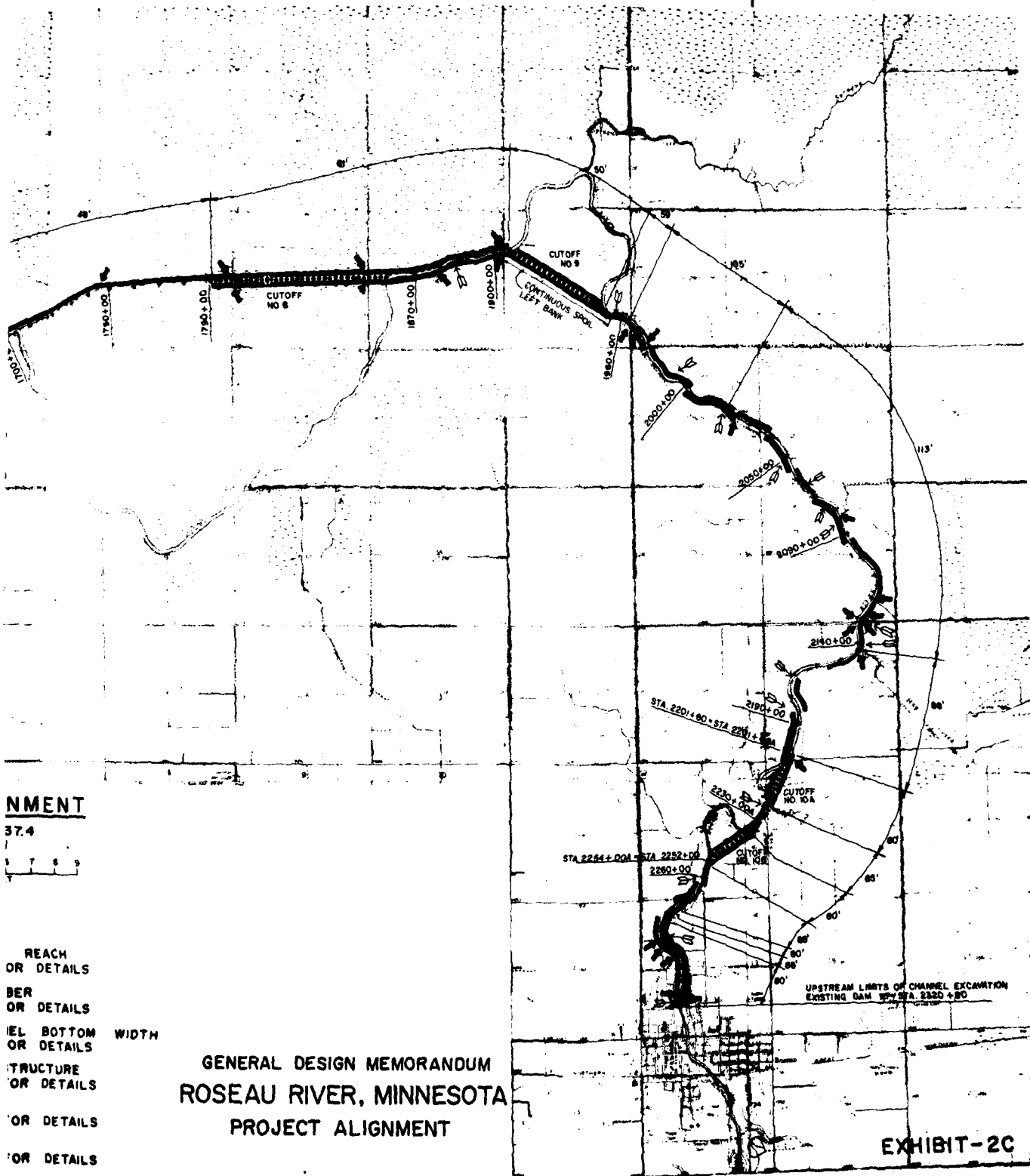
- UNEXCAVATED CHANNEL REACH  
SEE EXHIBIT 3 FOR DETAILS
- EXISTING OXBOW NUMBER  
SEE EXHIBIT 6 FOR DETAILS
- NEW EXCAVATED CHANNEL BOTTOM WIDTH  
SEE EXHIBIT 3 FOR DETAILS
- FISHERY MITIGATION STRUCTURE  
SEE EXHIBIT 7 FOR DETAILS
- LEVEE  
SEE EXHIBIT 3 FOR DETAILS
- SPOIL DISPOSAL AREA  
SEE EXHIBIT 3 FOR DETAILS

GENERAL DESIGN ME  
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GENERAL DESIGN MEMORANDUM  
ROSEAU RIVER, MINNESOTA  
PROJECT ALIGNMENT

EXHIBIT-2C

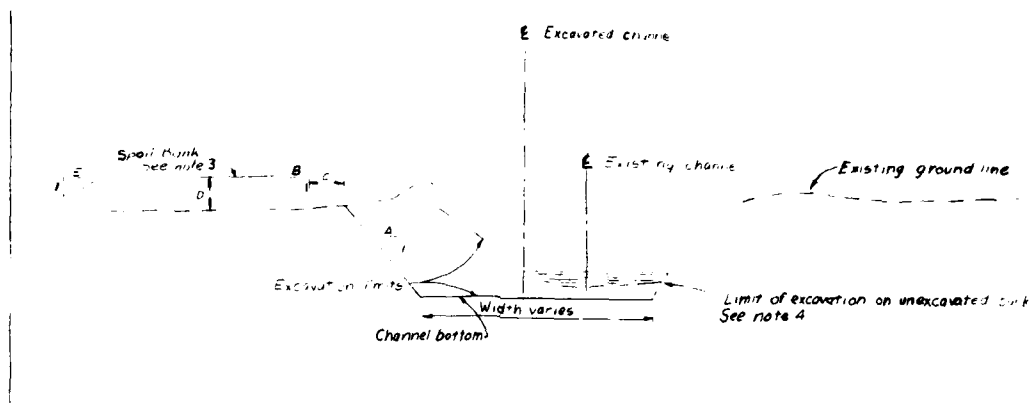




**Notes:**

- A. CHANNEL CONFIGURATIONS OF THE TRAPEZOIDAL CHANNEL SECTIONS ARE NOTED IN THE TABLE TO THE RIGHT.
- B. ALL ELEVATED AND UNEXCAVATED CHANNEL REACHES ARE LOCATED WITHIN REACH 1.
- C. EXACT LOCATIONS OF ELEVATED AND UNEXCAVATED CHANNEL REACHES TO BE VERIFIED IN THE FIELD.





TYPICAL TRAPEZOIDAL CHANNEL SECTION WITHOUT LEVEE (LEFT BANK EXCAVATION)

N.T.T. SCALE

ALLOWABLE CONFIGURATIONS  
AS DEFINED BY TYPICAL TRAPEZOIDAL SECTION ABOVE

REACH	STATION		C (MINIMUM)	D	LEFT BANK EXCAVATION			RIGHT BANK EXCAVATION		
	FROM	TO			A	B	E	A	B	E
1	0+00	1612+00	20	8	4	3	4	3	3	4
2	1612+00	1904+00	25	8	4	5	5	4	5	5
			75	6		5	5		5	5
			47	4		5	5		5	5
3	1904+00	1971+00	32	4	4	3	4	4	5	4
			84	4		3	4		5	4
			62	4		3	5		5	5
4	1971+00	2018+00	92	3	4	5	5	4	5	5
5	2018+00	2056+00	60	6	3	5	5	3	5	5
6	2056+00	2316+55	3	5	3	4	4	3	4	4
7	2316+55	2320+80	—	—	3	—	—	2	—	—

NOTES:

- FOR PLAN, CHANNEL BOTTOM WIDTH, AND DESIGNATED SIDE FOR EXCAVATION SEE EXHIBITS 1, 2A, 2B, 2C, & 3
- LEAVE OPENING IN SPOIL BANK WHERE REQUIRED FOR NATURAL DRAINAGE GRADE BERMS AND SPOIL BANKS TO DRAIN
- ALL SPOIL WILL BE PLACED ON THE SIDE OF THE CHANNEL DESIGNATED FOR EXCAVATION.
- ON THE UNEXCAVATED BANK, THE CHANNEL SIDE SLOPE AT THE BASE OF THE TRAPEZOIDAL CHANNEL WILL BE EXCAVATED ONLY TO THE EXTENT NECESSARY TO MAKE A SMOOTH TRANSITION BETWEEN THE TRAPEZOIDAL CHANNEL BOTTOM AND THE EXISTING CHANNEL BANK.
- WHEN BOTH BANK EXCAVATION IS USED, USE SAME CHANNEL CONFIGURATION FOR EACH BANK AS SHOWN IN THE TABLE ABOVE

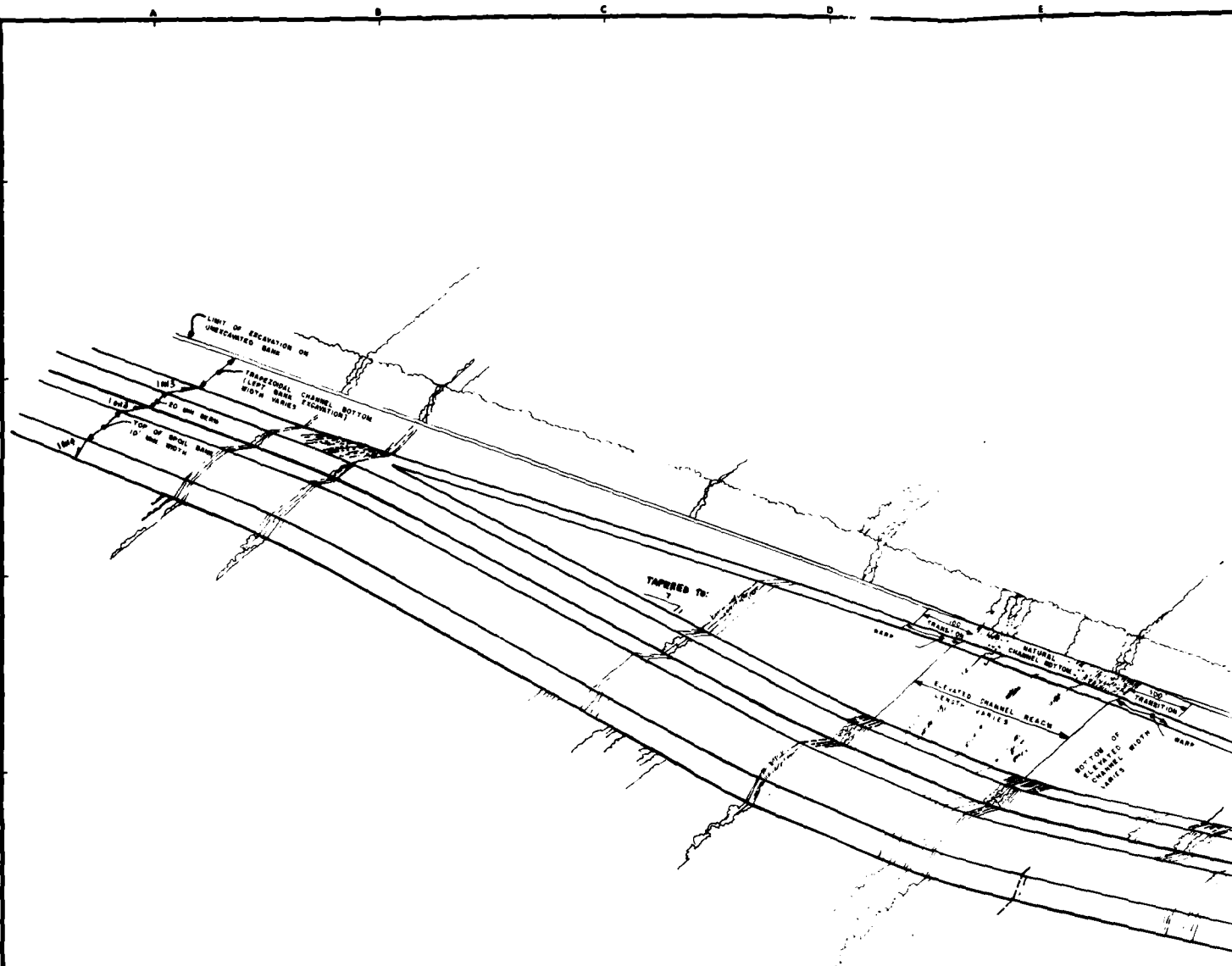
REACHES WITHIN REACH 1 (SEE NOTES A - C BELOW)				
REMARKS	STATION		TYPE OF CHANNEL SECTION	LENGTH OF REACH IN FT
	FROM	TO		
	677+20	743+00	TRAPEZOIDAL	
	743+00	748+00	ELEVATED	500
	748+00	766+50	TRAPEZOIDAL	
	766+50	769+50	ELEVATED	300
	769+50	826+60	TRAPEZOIDAL	
	826+60	831+80	ELEVATED	500
	831+80	857+00	TRAPEZOIDAL	
	857+00	861+00	ELEVATED	400
	861+00	940+00	TRAPEZOIDAL	
	940+00	945+00	ELEVATED	500
	945+00	989+60	TRAPEZOIDAL	
	989+60	994+60	ELEVATED	500
	994+60	1612+00	TRAPEZOIDAL	

2



STATION	DESCRIPTION	DATE	APPROVAL
DEPARTMENT OF THE ARMY ST. PAUL DISTRICT CORPS OF ENGINEERS ST. PAUL, MINNESOTA			
GENERAL DESIGN MEMORANDUM FLOOD CONTROL ROSEAU RIVER, MINNESOTA TYPICAL CHANNEL SECTION LEVEE AND CHANNEL SECTION - REACH 1			
DESIGNED BY: C. AMK DRAWN BY: H.S. JMJ CHECKED BY: R.G.B. SUBMITTED BY: [Signature] APPROVED: [Signature]		DATE: MAY 1960 SUPPLEMENT 2	
AS SHOWN		DRAWING NUMBER	
SHEET		OF	





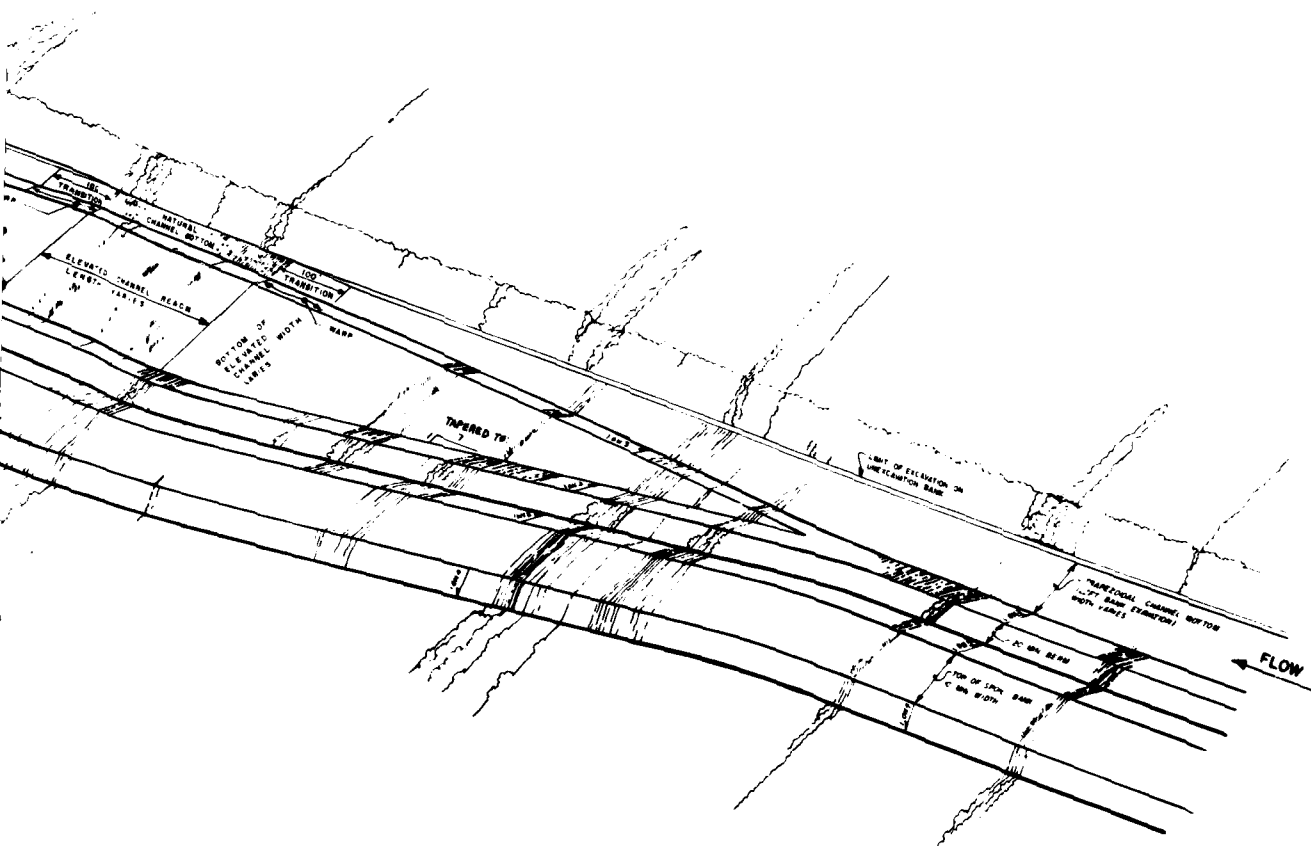
#### PERSPECTIVE VIEW

TYPICAL TRANSITION FROM LEFT-BANK  
TRAPEZOIDAL CHANNEL EXCAVATION  
TO ELEVATED CHANNEL EXCAVATION.

#### NOTES:

1. ALL ELEVATED CHANNEL REACHES ARE LOCATED WITHIN REACH 1
2. ON THE UNEXCAVATED BANK, THE CHANNEL SIDE SLOPE AT THE BASE OF THE TRAPEZOIDAL CHANNEL WILL BE EXCAVATED ONLY TO THE EXTENT NECESSARY TO MAKE A SMOOTH TRANSITION BETWEEN THE TRAPEZOIDAL CHANNEL BOTTOM AND THE EXISTING CHANNEL BANK.
3. ALL SPOIL WILL BE PLACED ON THE SIDE OF THE CHANNEL DESIGNATED FOR EXCAVATION.
4. THE MAXIMUM SPOIL PILE HEIGHT IS 8', THE TOP WIDTH WILL VARY DEPENDING ON AVAILABLE SPOIL.
5. SEE EXHIBIT 3 FOR TYPICAL ELEVATED CHANNEL SECTION AND LOCATION OF ELEVATED CHANNEL REACHES.



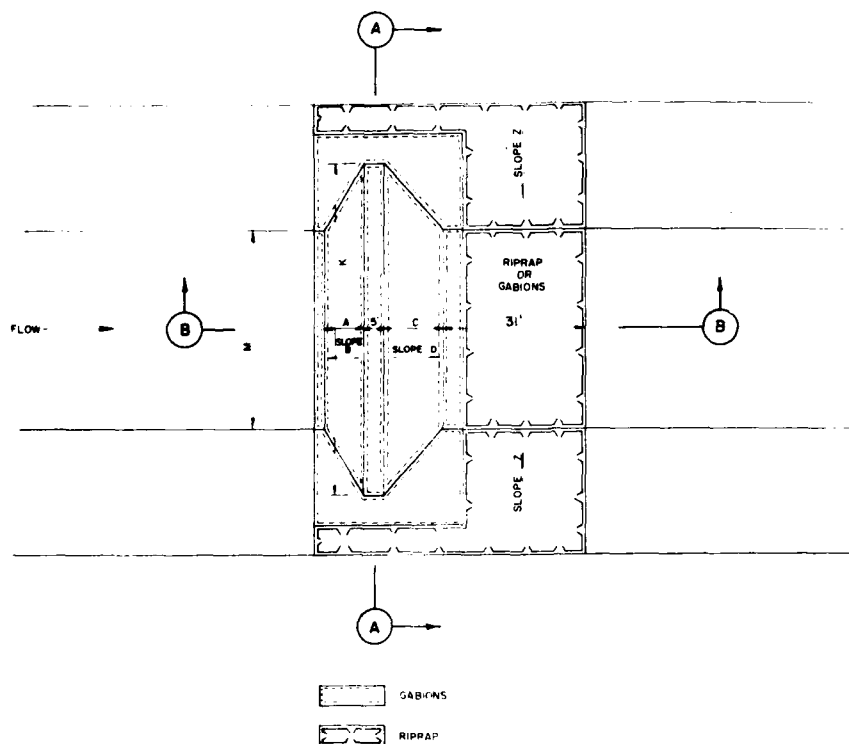


2

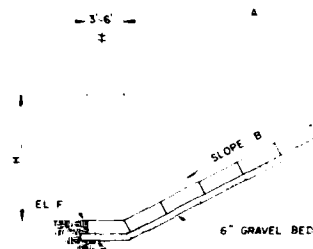


SYMBOL		DESCRIPTION		DATE	APPROVAL
DEPARTMENT OF THE ARMY ST PAUL DISTRICT CORPS OF ENGINEERS ST PAUL, MINNESOTA					
GENERAL DESIGN MEMORANDUM FLOOD CONTROL ROSEAU RIVER, MINNESOTA TRANSITIONS FROM TRAPEZOIDAL CHANNEL REACHES TO ELEVATED CHANNEL REACHES					
DESIGNED BY: A.M.K. CHECKED BY: C.R.C. ENGINEERED BY: R.C.B.		DATE: MAY 1960			
SUBMITTED BY: [Signature] APPROVED: [Signature]		SUPPLEMENT 2			
SCALE: NOT TO SCALE		DRAWING NUMBER			
SHEET		OF			





**TYPICAL PLAN**  
CUTOFF DIVERSION STRUCTURE 1, 3, 5, 6, 7, 8, 9, 10a, 10b  
SCALE: 1" = 20'



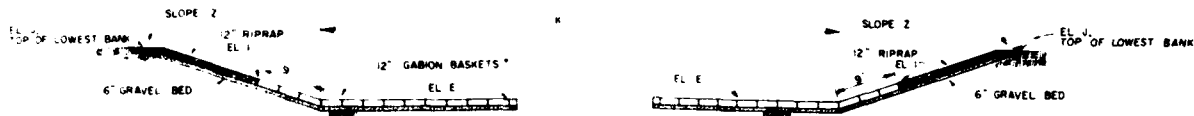
**CUTOFF DIVERSION STRUCTURE DIMENSIONS (FT.) SLOPES, AND ELEVATIONS (G.C.S. 1928 ADJ.)**

CUTOFF DIVERSION CHANNEL SIZE DETERMINATIONS (F.V. 553) (F.V. 554) (F.V. 555) (F.V. 556) (F.V. 557) (F.V. 558) (F.V. 559) (F.V. 560) (F.V. 561) (F.V. 562) (F.V. 563) (F.V. 564) (F.V. 565) (F.V. 566) (F.V. 567) (F.V. 568) (F.V. 569) (F.V. 570) (F.V. 571) (F.V. 572) (F.V. 573) (F.V. 574) (F.V. 575) (F.V. 576) (F.V. 577) (F.V. 578) (F.V. 579) (F.V. 580) (F.V. 581) (F.V. 582) (F.V. 583) (F.V. 584) (F.V. 585) (F.V. 586) (F.V. 587) (F.V. 588) (F.V. 589) (F.V. 590) (F.V. 591) (F.V. 592) (F.V. 593) (F.V. 594) (F.V. 595) (F.V. 596) (F.V. 597) (F.V. 598) (F.V. 599) (F.V. 600) (F.V. 601) (F.V. 602) (F.V. 603) (F.V. 604) (F.V. 605) (F.V. 606) (F.V. 607) (F.V. 608) (F.V. 609) (F.V. 610) (F.V. 611) (F.V. 612) (F.V. 613) (F.V. 614) (F.V. 615) (F.V. 616) (F.V. 617) (F.V. 618) (F.V. 619) (F.V. 620) (F.V. 621) (F.V. 622) (F.V. 623) (F.V. 624) (F.V. 625) (F.V. 626) (F.V. 627) (F.V. 628) (F.V. 629) (F.V. 630) (F.V. 631) (F.V. 632) (F.V. 633) (F.V. 634) (F.V. 635) (F.V. 636) (F.V. 637) (F.V. 638) (F.V. 639) (F.V. 640) (F.V. 641) (F.V. 642) (F.V. 643) (F.V. 644) (F.V. 645) (F.V. 646) (F.V. 647) (F.V. 648) (F.V. 649) (F.V. 650) (F.V. 651) (F.V. 652) (F.V. 653) (F.V. 654) (F.V. 655) (F.V. 656) (F.V. 657) (F.V. 658) (F.V. 659) (F.V. 660) (F.V. 661) (F.V. 662) (F.V. 663) (F.V. 664) (F.V. 665) (F.V. 666) (F.V. 667) (F.V. 668) (F.V. 669) (F.V. 670) (F.V. 671) (F.V. 672) (F.V. 673) (F.V. 674) (F.V. 675) (F.V. 676) (F.V. 677) (F.V. 678) (F.V. 679) (F.V. 680) (F.V. 681) (F.V. 682) (F.V. 683) (F.V. 684) (F.V. 685) (F.V. 686) (F.V. 687) (F.V. 688) (F.V. 689) (F.V. 690) (F.V. 691) (F.V. 692) (F.V. 693) (F.V. 694) (F.V. 695) (F.V. 696) (F.V. 697) (F.V. 698) (F.V. 699) (F.V. 700) (F.V. 701) (F.V. 702) (F.V. 703) (F.V. 704) (F.V. 705) (F.V. 706) (F.V. 707) (F.V. 708) (F.V. 709) (F.V. 710) (F.V. 711) (F.V. 712) (F.V. 713) (F.V. 714) (F.V. 715) (F.V. 716) (F.V. 717) (F.V. 718) (F.V. 719) (F.V. 720) (F.V. 721) (F.V. 722) (F.V. 723) (F.V. 724) (F.V. 725) (F.V. 726) (F.V. 727) (F.V. 728) (F.V. 729) (F.V. 730) (F.V. 731) (F.V. 732) (F.V. 733) (F.V. 734) (F.V. 735) (F.V. 736) (F.V. 737) (F.V. 738) (F.V. 739) (F.V. 740) (F.V. 741) (F.V. 742) (F.V. 743) (F.V. 744) (F.V. 745) (F.V. 746) (F.V. 747) (F.V. 748) (F.V. 749) (F.V. 750) (F.V. 751) (F.V. 752) (F.V. 753) (F.V. 754) (F.V. 755) (F.V. 756) (F.V. 757) (F.V. 758) (F.V. 759) (F.V. 760) (F.V. 761) (F.V. 762) (F.V. 763) (F.V. 764) (F.V. 765) (F.V. 766) (F.V. 767) (F.V. 768) (F.V. 769) (F.V. 770) (F.V. 771) (F.V. 772) (F.V. 773) (F.V. 774) (F.V. 775) (F.V. 776) (F.V. 777) (F.V. 778) (F.V. 779) (F.V. 780) (F.V. 781) (F.V. 782) (F.V. 783) (F.V. 784) (F.V. 785) (F.V. 786) (F.V. 787) (F.V. 788) (F.V. 789) (F.V. 790) (F.V. 791) (F.V. 792) (F.V. 793) (F.V. 794) (F.V. 795) (F.V. 796) (F.V. 797) (F.V. 798) (F.V. 799) (F.V. 800) (F.V. 801) (F.V. 802) (F.V. 803) (F.V. 804) (F.V. 805) (F.V. 806) (F.V. 807) (F.V. 808) (F.V. 809) (F.V. 810) (F.V. 811) (F.V. 812) (F.V. 813) (F.V. 814) (F.V. 815) (F.V. 816) (F.V. 817) (F.V. 818) (F.V. 819) (F.V. 820) (F.V. 821) (F.V. 822) (F.V. 823) (F.V. 824) (F.V. 825) (F.V. 826) (F.V. 827) (F.V. 828) (F.V. 829) (F.V. 830) (F.V. 831) (F.V. 832) (F.V. 833) (F.V. 834) (F.V. 835) (F.V. 836) (F.V. 837) (F.V. 838) (F.V. 839) (F.V. 840) (F.V. 841) (F.V. 842) (F.V. 843) (F.V. 844) (F.V. 845) (F.V. 846) (F.V. 847) (F.V. 848) (F.V. 849) (F.V. 850) (F.V. 851) (F.V. 852) (F.V. 853) (F.V. 854) (F.V. 855) (F.V. 856) (F.V. 857) (F.V. 858) (F.V. 859) (F.V. 860) (F.V. 861) (F.V. 862) (F.V. 863) (F.V. 864) (F.V. 865) (F.V. 866) (F.V. 867) (F.V. 868) (F.V. 869) (F.V. 870) (F.V. 871) (F.V. 872) (F.V. 873) (F.V. 874) (F.V. 875) (F.V. 876) (F.V. 877) (F.V. 878) (F.V. 879) (F.V. 880) (F.V. 881) (F.V. 882) (F.V. 883) (F.V. 884) (F.V. 885) (F.V. 886) (F.V. 887) (F.V. 888) (F.V. 889) (F.V. 890) (F.V. 891) (F.V. 892) (F.V. 893) (F.V. 894) (F.V. 895) (F.V. 896) (F.V. 897) (F.V. 898) (F.V. 899) (F.V. 900) (F.V. 901) (F.V. 902) (F.V. 903) (F.V. 904) (F.V. 905) (F.V. 906) (F.V. 907) (F.V. 908) (F.V. 909) (F.V. 910) (F.V. 911) (F.V. 912) (F.V. 913) (F.V. 914) (F.V. 915) (F.V. 916) (F.V. 917) (F.V. 918) (F.V. 919) (F.V. 920) (F.V. 921) (F.V. 922) (F.V. 923) (F.V. 924) (F.V. 925) (F.V. 926) (F.V. 927) (F.V. 928) (F.V. 929) (F.V. 930) (F.V. 931) (F.V. 932) (F.V. 933) (F.V. 934) (F.V. 935) (F.V. 936) (F.V. 937) (F.V. 938) (F.V. 939) (F.V. 940) (F.V. 941) (F.V. 942) (F.V. 943) (F.V. 944) (F.V. 945) (F.V. 946) (F.V. 947) (F.V. 948) (F.V. 949) (F.V. 950) (F.V. 951) (F.V. 952) (F.V. 953) (F.V. 954) (F.V. 955) (F.V. 956) (F.V. 957) (F.V. 958) (F.V. 959) (F.V. 960) (F.V. 961) (F.V. 962) (F.V. 963) (F.V. 964) (F.V. 965) (F.V. 966) (F.V. 967) (F.V. 968) (F.V. 969) (F.V. 970) (F.V. 971) (F.V. 972) (F.V. 973) (F.V. 974) (F.V. 975) (F.V. 976) (F.V. 977) (F.V. 978) (F.V. 979) (F.V. 980) (F.V. 981) (F.V. 982) (F.V. 983) (F.V. 984) (F.V. 985) (F.V. 986) (F.V. 987) (F.V. 988) (F.V. 989) (F.V. 990) (F.V. 991) (F.V. 992) (F.V. 993) (F.V. 994) (F.V. 995) (F.V. 996) (F.V. 997) (F.V. 998) (F.V. 999) (F.V. 1000) (F.V. 1001) (F.V. 1002) (F.V. 1003) (F.V. 1004) (F.V. 1005) (F.V. 1006) (F.V. 1007) (F.V. 1008) (F.V. 1009) (F.V. 1010) (F.V. 1011) (F.V. 1012) (F.V. 1013) (F.V. 1014) (F.V. 1015) (F.V. 1016) (F.V. 1017) (F.V. 1018) (F.V. 1019) (F.V. 1020) (F.V. 1021) (F.V. 1022) (F.V. 1023) (F.V. 1024) (F.V. 1025) (F.V. 1026) (F.V. 1027) (F.V. 1028) (F.V. 1029) (F.V. 1030) (F.V. 1031) (F.V. 1032) (F.V. 1033) (F.V. 1034) (F.V. 1035) (F.V. 1036) (F.V. 1037) (F.V. 1038) (F.V. 1039) (F.V. 1040) (F.V. 1041) (F.V. 1042) (F.V. 1043) (F.V. 1044) (F.V. 1045) (F.V. 1046) (F.V. 1047) (F.V. 1048) (F.V. 1049) (F.V. 1050) (F.V. 1051) (F.V. 1052) (F.V. 1053) (F.V. 1054) (F.V. 1055) (F.V. 1056) (F.V. 1057) (F.V. 1058) (F.V. 1059) (F.V. 1060) (F.V. 1061) (F.V. 1062) (F.V. 1063) (F.V. 1064) (F.V. 1065) (F.V. 1066) (F.V. 1067) (F.V. 1068) (F.V. 1069) (F.V. 1070) (F.V. 1071) (F.V. 1072) (F.V. 1073) (F.V. 1074) (F.V. 1075) (F.V. 1076) (F.V. 1077) (F.V. 1078) (F.V. 1079) (F.V. 1080) (F.V. 1081) (F.V. 1082) (F.V. 1083) (F.V. 1084) (F.V. 1085) (F.V. 1086) (F.V. 1087) (F.V. 1088) (F.V. 1089) (F.V. 1090) (F.V. 1091) (F.V. 1092) (F.V. 1093) (F.V. 1094) (F.V. 1095) (F.V. 1096) (F.V. 1097) (F.V. 1098) (F.V. 1099) (F.V. 1100) (F.V. 1101) (F.V. 1102) (F.V. 1103) (F.V. 1104) (F.V. 1105) (F.V. 1106) (F.V. 1107) (F.V. 1108) (F.V. 1109) (F.V. 1110) (F.V. 1111) (F.V. 1112) (F.V. 1113) (F.V. 1114) (F.V. 1115) (F.V. 1116) (F.V. 1117) (F.V. 1118) (F.V. 1119) (F.V. 1120) (F.V. 1121) (F.V. 1122) (F.V. 1123) (F.V. 1124) (F.V. 1125) (F.V. 1126) (F.V. 1127) (F.V. 1128) (F.V. 1129) (F.V. 1130) (F.V. 1131) (F.V. 1132) (F.V. 1133) (F.V. 1134) (F.V. 1135) (F.V. 1136) (F.V. 1137) (F.V. 1138) (F.V. 1139) (F.V. 1140) (F.V. 1141) (F.V. 1142) (F.V. 1143) (F.V. 1144) (F.V. 1145) (F.V. 1146) (F.V. 1147) (F.V. 1148) (F.V. 1149) (F.V. 1150) (F.V. 1151) (F.V. 1152) (F.V. 1153) (F.V. 1154) (F.V. 1155) (F.V. 1156) (F.V. 1157) (F.V. 1158) (F.V. 1159) (F.V. 1160) (F.V. 1161) (F.V. 1162) (F.V. 1163) (F.V. 1164) (F.V. 1165) (F.V. 1166) (F.V. 1167) (F.V. 1168) (F.V. 1169) (F.V. 1170) (F.V. 1171) (F.V. 1172) (F.V. 1173) (F.V. 1174) (F.V. 1175) (F.V. 1176) (F.V. 1177) (F.V. 1178) (F.V. 1179) (F.V. 1180) (F.V. 1181) (F.V. 1182) (F.V. 1183) (F.V. 1184) (F.V. 1185) (F.V. 1186) (F.V. 1187) (F.V. 1188) (F.V. 1189) (F.V. 1190) (F.V. 1191) (F.V. 1192) (F.V. 1193) (F.V. 1194) (F.V. 1195) (F.V. 1196) (F.V. 1197) (F.V. 1198) (F.V. 1199) (F.V. 1200) (F.V. 1201) (F.V. 1202) (F.V. 1203) (F.V. 1204) (F.V. 1205) (F.V. 1206) (F.V. 1207) (F.V. 1208) (F.V. 1209) (F.V. 1210) (F.V. 1211) (F.V. 1212) (F.V. 1213) (F.V. 1214) (F.V. 1215) (F.V. 1216) (F.V. 1217) (F.V. 1218) (F.V. 1219) (F.V. 1220) (F.V. 1221) (F.V. 1222) (F.V. 1223) (F.V. 1224) (F.V. 1225) (F.V. 1226) (F.V. 1227) (F.V. 1228) (F.V. 1229) (F.V. 1230) (F.V. 1231) (F.V. 1232) (F.V. 1233) (F.V. 1234) (F.V. 1235) (F.V. 1236) (F.V. 1237) (F.V. 1238) (F.V. 1239) (F.V. 1240) (F.V. 1241) (F.V. 1242) (F.V. 1243) (F.V. 1244) (F.V. 1245) (F.V. 1246) (F.V. 1247) (F.V. 1248) (F.V. 1249) (F.V. 1250) (F.V. 1251) (F.V. 1252) (F.V. 1253) (F.V. 1254) (F.V. 1255) (F.V. 1256) (F.V. 1257) (F.V. 1258) (F.V. 1259) (F.V. 1260) (F.V. 1261) (F.V. 1262) (F.V. 1263) (F.V. 1264) (F.V. 1265) (F.V. 1266) (F.V. 1267) (F.V. 1268) (F.V. 1269) (F.V. 1270) (F.V. 1271) (F.V. 1272) (F.V. 1273) (F.V. 1274) (F.V. 1275) (F.V. 1276) (F.V. 1277) (F.V. 1278) (F.V. 1279) (F.V. 1280) (F.V. 1281) (F.V. 1282) (F.V. 1283) (F.V. 1284) (F.V. 1285) (F.V. 1286) (F.V. 1287) (F.V. 1288) (F.V. 1289) (F.V. 1290) (F.V. 1291) (F.V. 1292) (F.V. 1293) (F.V. 1294) (F.V. 1295) (F.V. 1296) (F.V. 1297) (F.V. 1298) (F.V. 1299) (F.V. 1300) (F.V. 1301) (F.V. 1302) (F.V. 1303) (F.V. 1304) (F.V. 1305) (F.V. 1306) (F.V. 1307) (F.V. 1308) (F.V. 1309) (F.V. 1310) (F.V. 1311) (F.V. 1312) (F.V. 1313) (F.V. 1314) (F.V. 1315) (F.V. 1316) (F.V. 1317) (F.V. 1318) (F.V. 1319) (F.V. 1320) (F.V. 1321) (F.V. 1322) (F.V. 1323) (F.V. 1324) (F.V. 1325) (F.V. 1326) (F.V. 1327) (F.V. 1328) (F.V. 1329) (F.V. 1330) (F.V. 1331) (F.V. 1332) (F.V. 1333) (F.V. 1334) (F.V. 1335) (F.V. 1336) (F.V. 1337) (F.V. 1338) (F.V. 1339) (F.V. 1340) (F.V. 1341) (F.V. 1342) (F.V. 1343) (F.V. 1344) (F.V. 1345) (F.V. 1346) (F.V. 1347) (F.V. 1348) (F.V. 1349) (F.V. 1350) (F.V. 1351) (F.V. 1352) (F.V. 1353) (F.V. 1354) (F.V. 1355) (F.V. 1356) (F.V. 1357) (F.V. 1358) (F.V. 1359) (F.V. 1360) (F.V. 1361) (F.V. 1362) (F.V. 1363) (F.V. 1364) (F.V. 1365) (F.V. 1366) (F.V. 1367) (F.V. 1368) (F.V. 1369) (F.V. 1370) (F.V. 1371) (F.V. 1372) (F.V. 1373) (F.V. 1374) (F.V. 1375) (F.V. 1376) (F.V. 1377) (F.V. 1378) (F.V. 1379) (F.V. 1380) (F.V. 1381) (F.V. 1382) (F.V. 1383) (F.V. 1384) (F.V. 1385) (F.V. 1386) (F.V. 1387) (F.V. 1388) (F.V. 1389) (F.V. 1390) (F.V. 1391) (F.V. 1392) (F.V. 1393) (F.V. 1394) (F.V. 1395) (F.V. 1396) (F.V. 1397) (F.V. 1398) (F.V. 1399) (F.V. 1400) (F.V. 1401) (F.V. 1402) (F.V. 1403) (F.V. 1404) (F.V. 1405) (F.V. 1406) (F.V. 1407) (F.V. 1408) (F.V. 1409) (F.V. 1410) (F.V. 1411) (F.V. 1412) (F.V. 1413) (F.V. 1414) (F.V. 1415) (F.V. 1416) (F.V. 1417) 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(F.V. 1750) (F.V. 1751) (F.V. 1752) (F.V. 1753) (F.V. 1754) (F.V. 1755) (F.V. 1756) (F.V. 1757) (F.V. 1758) (F.V. 1759) (F.V. 1760) (F.V. 1761) (F.V. 1762) (F.V. 1763) (F.V. 1764) (F.V. 1765) (F.V. 1766) (F.V. 1767) (F.V. 1768) (F.V. 1769) (F.V. 1770) (F.V. 1771) (F.V. 1772) (F.V. 1773) (F.V. 1774) (F.V. 1775) (F.V. 1776) (F.V. 1777) (F.V. 1778) (F.V. 1779) (F.V. 1780) (F.V. 1781) (F.V. 1782) (F.V. 1783) (F.V. 1784) (F.V. 1785) (F.V. 1786) (F.V. 1787) (F.V. 1788) (F.V. 1789) (F.V. 1790) (F.V. 1791) (F.V. 1792) (F.V. 1793) (F.V. 1794) (F.V. 1795) (F.V. 1796) (F.V. 1797) (F.V. 1798) (F.V. 1799) (F.V. 1800) (F.V. 1801) (F.V. 1802) (F.V. 1803) (F.V. 1804) (F.V. 1805) (F.V. 1806) (F.V. 1807) (F.V. 1808) (F.V. 1809) (F.V. 1810) (F.V. 1811) (F.V. 1812) (F.V. 1813) (F.V. 1814) (F.V. 1815) (F.V. 1816) (F.V. 1817) (F.V. 1818) (F.V. 1819) (F.V. 1820) (F.V. 1821) (F.V. 1822) (F.V. 1823) (F.V. 1824) (F.V. 1825) (F.V. 1826) (F.V. 1827) (F.V. 1828) (F.V. 1829) (F.V. 1830) (F.V. 1831) (F.V. 1832) (F.V. 1833)													
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\*THE DIVERSION CONTROL STRUCTURE IN CUTOFF NO 8 WILL HAVE A CREST WIDTH OF 20' WITH A 3" ASPHALT CAP IN ORDER TO PROVIDE ACCESS ACROSS THE CUTOFF CHANNEL FOR FARM EQUIPMENT. THE CHANNEL SLOPE ABOVE CREST ELEVATION WILL BE 1V on 8H IN ORDER TO PROVIDE A SMOOTH TRANSITION FOR ROADWAY TO TOP OF BANK ELEVATION

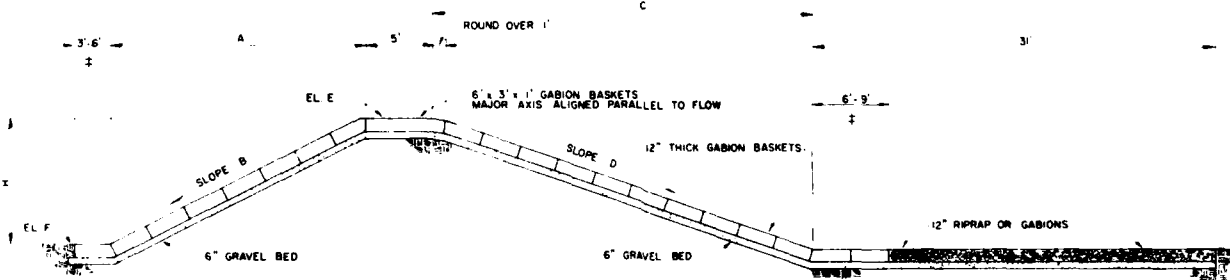
SCHEDULE OF GABION DIMENSIONS		
LETTER CODE	APPROX SIZE	CAPACITY CUBIC YARDS
G	6' x 3' x 1'	0.67
H	9' x 3' x 1'	1
I	12' x 5' x 1'	1.33





\* ALIGNMENT OF MAJOR AXIS PARALLEL TO FLOW

**SECTION A-A**  
SCALE: 1" = 10'



1 LENGTH AS NEEDED TO FIT WHOLE GABIONS

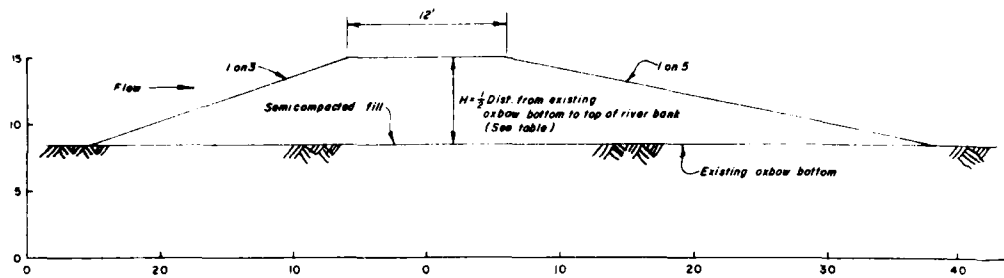
**SECTION B-B**  
SCALE: 1" = 5'

SCHEDULE OF GABION DIMENSIONS		
LETTER CODE	APPROX SIZE	CAPACITY CUBIC YARDS
G	6 x 3 x 1	0.67
H	9 x 3 x 1	1
I	12 x 3 x 1	1.33



DESIGNED BY AMK DRG RGB	DEPARTMENT OF THE ARMY ST PAUL DISTRICT CORPS OF ENGINEERS ST PAUL, MINNESOTA	DATE	APPROVAL
CHECKED BY PAW	GENERAL DESIGN MEMORANDUM FLOOD CONTROL		
CHECKED BY GVF	ROSEAU RIVER, MINNESOTA		
SUBMITTED BY	CUTOFF DIVERSION STRUCTURES		
APPROVED	SUPPLEMENT 2	DATE MAY 1960	
		AS SHOWN DRAWING NUMBER	
		SHEET OF	





**TYPICAL UPSTREAM CONSERVATION PLUG**

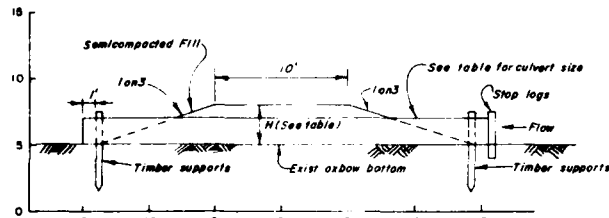
(6 PERMANENT AND 5 TEMPORARY REQ'D.)

UPSTREAM CONSERVATION	
OXBOW NUMBER	TYPE OF PLUG REQ'D.
1	TEMPORARY
2	* PERMANENT
3	* PERMANENT
4	PERMANENT
5	PERMANENT
6	PERMANENT
7	PERMANENT
8	TEMPORARY
9	TEMPORARY
10	TEMPORARY
11	TEMPORARY

NO UPSTREAM CONSERVATION PLUG REQ'D. IN OXBOW NOS. 12 & 13

**NOTE:**

\* IF EXIST OF PROF INSTALL

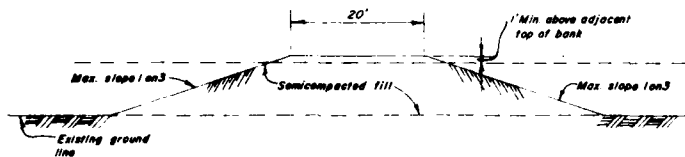


**TYPICAL DOWNSTREAM CONSERVATION PLUG**

(6 REQ'D.)

DOWNSTREAM CONSERVATION PLUGS			
OXBOW NUMBER	HEIGHT (H)	CULVERT SIZE	CULVERT LENGTH
2	3.0'	24"	30'
3	3.0'	24"	30'
4	2.5'	24"	27'
5	2.5'	24"	27'
6	1.5'	18"	21'
7	2.0'	18"	24'

NO DOWNSTREAM CONSERVATION PLUG REQ'D. IN OXBOW NUMBER 1, 8, 9, 10, 11, 12, & 13



**TYPICAL CHANNEL PLUG**

(4 REQ'D.)



UPSTREAM CONSERVATION PLUGS		
OXBOW NUMBER	TYPE OF PLUG REQ'D.	HEIGHT (H)
1	TEMPORARY	6.5'
2	* PERMANENT	6.0'
3	* PERMANENT	5.0'
4	PERMANENT	4.5'
5	PERMANENT	5.0'
6	PERMANENT	4.5'
7	PERMANENT	4.5'
8	TEMPORARY	4.0'
9	TEMPORARY	4.0'
10	TEMPORARY	3.5'
11	TEMPORARY	4.5'

NO UPSTREAM CONSERVATION PLUG REQ'D  
IN OXBOW NOS. 12 & 13

NOTE:

- \* IF EXISTING PERMANENT PLUG IS REMOVED AS A RESULT OF PROPOSED CHANNEL EXCAVATION, A NEW PLUG WILL BE INSTALLED.

DOWNSTREAM CONSERVATION PLUGS			
OXBOW NUMBER	HEIGHT (H)	CULVERT SIZE	CULVERT LENGTH
2	5.0	24"	30'
3	5.0	24"	30'
4	2.5	24"	27'
5	2.5	24"	27'
6	1.5	18"	21'
7	2.0	18"	24'

NO DOWNSTREAM CONSERVATION PLUG  
REQ'D IN OXBOW NUMBER 1, 8, 9, 10, 11, 12, & 13

NOTE

EXACT LOCATION OF CONSERVATION PLUGS  
TO BE VERIFIED IN THE FIELD



DESIGNED BY  
DRLD & WHP

DRAWN BY

CHECKED BY JMJ

APPROVED BY RGB

SUBMITTED BY

APPROVED

DATE

HCSEA R. 1111

SUPPLEMENT



AD A121 928

FLOOD CONTROL ROSEAU RIVER ROSEAU AND KITTSON COUNTIES

2/3

MINNESOTA FINAL ENVIRONMENTAL IMPACT STATEMENT

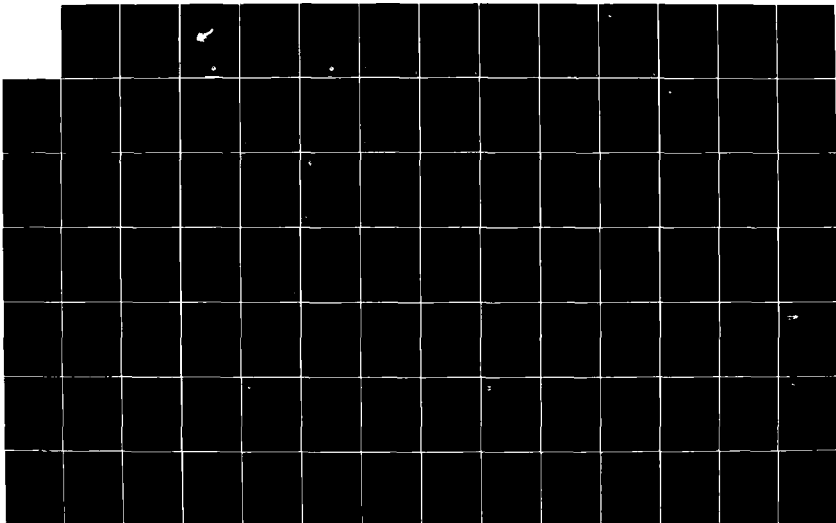
SUPPLEMENT(U) CORPS OF ENGINEERS ST PAUL MN ST PAUL

UNCLASSIFIED

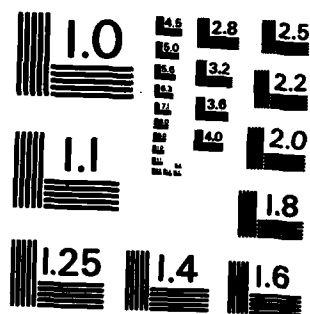
DISTRICT SEP 81

F/G 13/2

NL

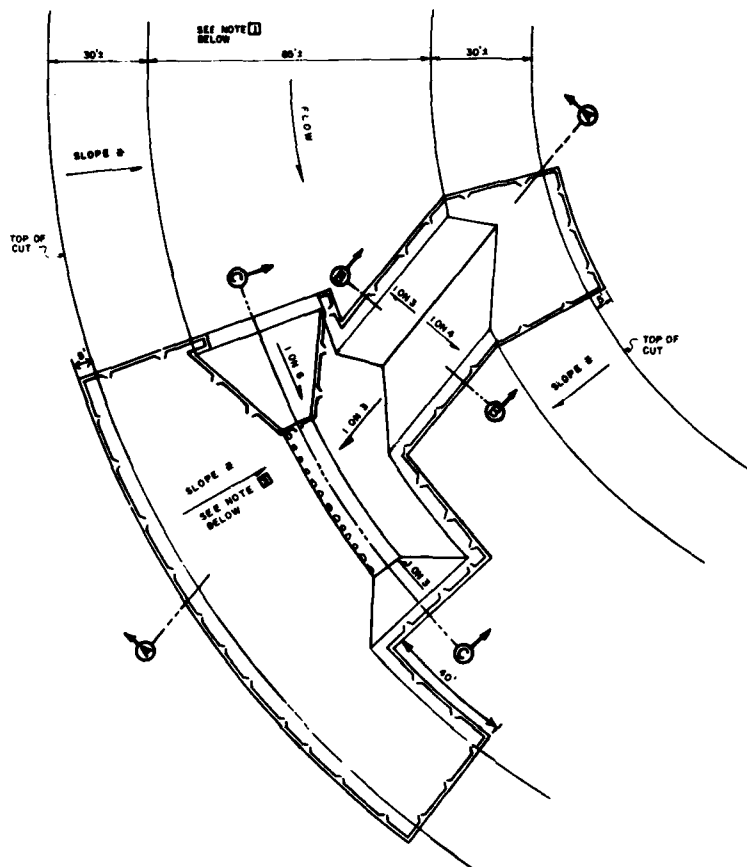




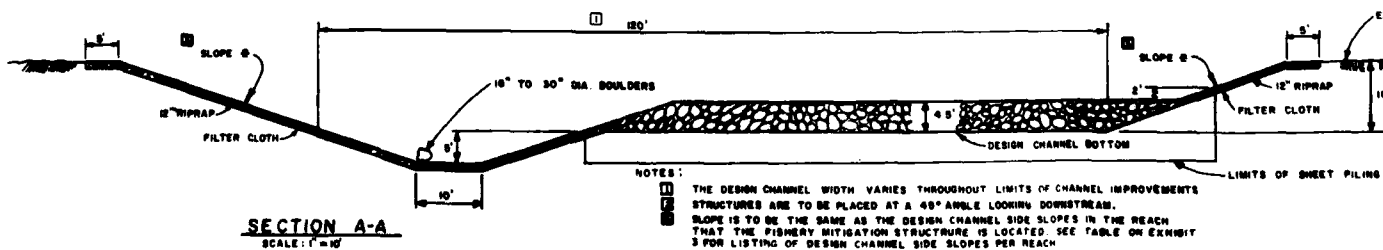


MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A





**PLAN VIEW**  
SCALE: 1" = 20'  
FISHERY MITIGATION STRUCTURE

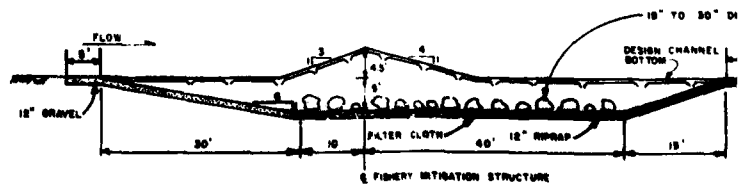


**SECTION A-A**  
SCALE: 1" = 10'

**NOTES:**  
1. THE DESIGN CHANNEL WIDTH VARIES THROUGHOUT LIMITS OF CHANNEL IMPROVEMENTS  
2. STRUCTURES ARE TO BE PLACED AT A 45° ANGLE LOOKING DOWNSTREAM.  
3. SLOPE IS TO BE THE SAME AS THE DESIGN CHANNEL SIDE SLOPES IN THE REACH THAT THE FISHERY MITIGATION STRUCTURE IS LOCATED. SEE TABLE ON EXHIBIT 3 FOR LISTING OF DESIGN CHANNEL SIDE SLOPES PER REACH

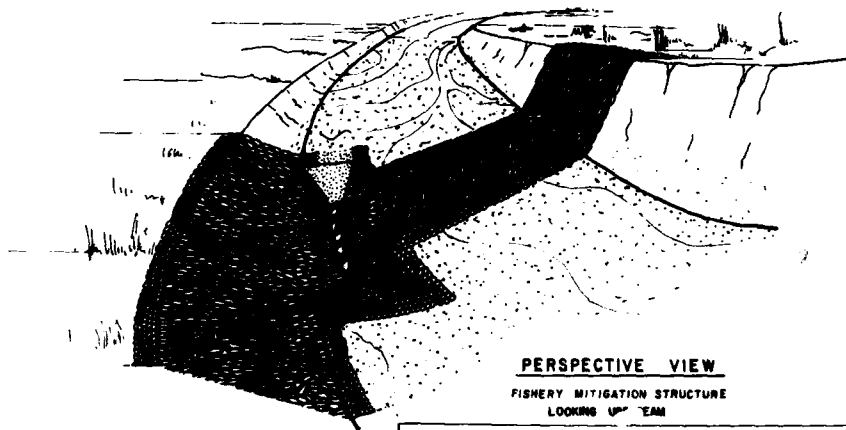


**SECTION B-B**  
SCALE: 1" = 10'



**SECTION C-C**  
SCALE: 1" = 10'





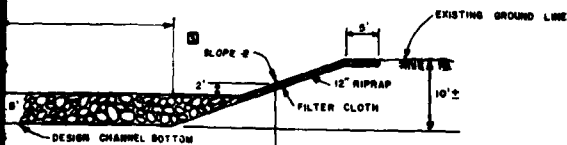
PERSPECTIVE VIEW

FISHERY MITIGATION STRUCTURE  
LOOKING UP REACH

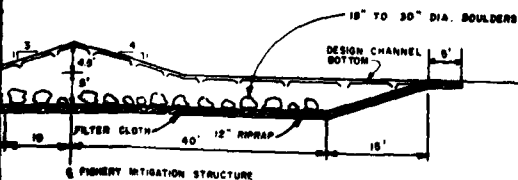
\* LOCATION OF FISHERY MITIGATION STRUCTURES

FISH HABITAT DEVELOPMENT NO.	IDENT. CODE	STATION	FISH HABITAT DEVELOPMENT NO.	IDENT. CODE	STATION	FISH HABITAT DEVELOPMENT NO.	IDENT. CODE	STATION
1	AA	342+20	24	E	872+00	47	F37A	2050+00
2	X	389+80	25	C	1008+00	48	F37B	2068+00
3	V	444+50	26	B	1030+00	49	F34-R35	2075+00
4	T	480+80	27	A	1070+00	50	R33-F32	2085+00
5	S	501+30	28	A	1120+00	51	P30	2130+00
6	R	545+20	29	P60	1188+00	52	P28	2140+00
7	Q	575+20	30	F59	1228+00	53	P25-F22	2170+00
8	O	603+30	31	F57B	1340+00	54	P23-F22	2185+00
9	N	635+20	32	R54-F58	1397+00	55	R18-P19	2223+00
10	K	674+70	33	F53A	1425+00	56	R14-F18	2260+00
11	J	748+80	34	F53B	1448+00	57	R6-P6	2290+00
12	I	788+00	35	F53C	1470+00	58	R1-P2	2320+00
13	H	829+10	36	R32-P32	1500+00			
14	F	865+00	37	P52A	1540+00			
15	D	942+50	38	P52B	1558+00			
16	C	992+10	39	P52C	1598+00			
17	Y	345+00	40	P52D	1610+00			
18	P8	400+00	41	F49D	1632+00			
19	L		42	F49C	1680+00			
20	K	683+00	43	NONE	1895+00			
21	J	720+00	44	F39A	1960+00			
22	R56	813+00	45	F39B	1993+00			
23	S	840+00	46	F37	2018+00			

\* EXACT LOCATION OF FISHERY MITIGATION STRUCTURES TO BE VERIFIED IN THE FIELD.



WITHOUT LIMITS OF CHANNEL IMPROVEMENTS  
ANGLE LOOKING DOWNSTREAM.  
CHANNEL SIDE SLOPES IN THE REACH  
UPSTREAM IS LOCATED. SEE TABLE ON EXHIBIT  
SLOPES PER REACH



SECTION C-C  
SCALE: 1"=10'

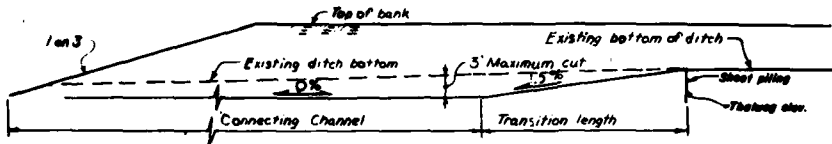
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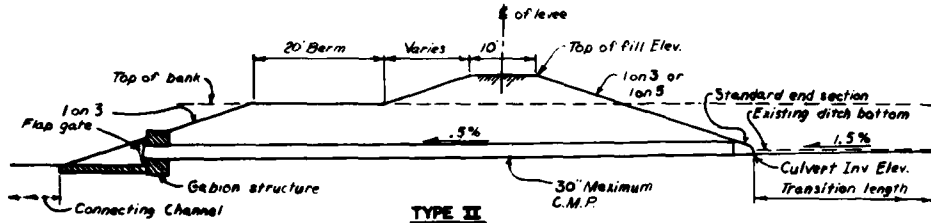
DEPARTMENT OF THE ARMY ST PAUL DISTRICT CORPS OF ENGINEERS ST PAUL, MINNESOTA	
DESIGNED BY: A.K.K. P.M.F. CHECKED BY: C.R.C. DRAWN BY: R.C.B. SUBMITTED BY: [Signature] APPROVED BY: [Signature]	GENERAL DESIGN MEMORANDUM FLOOD CONTROL ROSEAU RIVER, MINNESOTA FISHERY MITIGATION STRUCTURES SUPPLEMENT 2 DATE: MAY 1980 DRAWN: [Signature] CHECKED: [Signature] DESIGNED: [Signature]

EXHIBIT 7

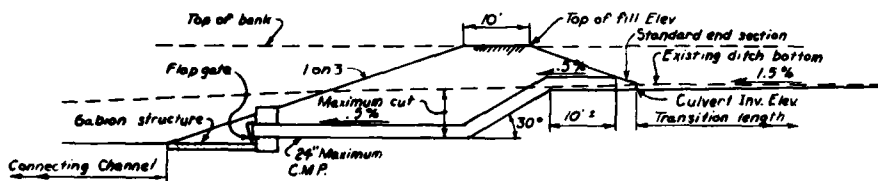




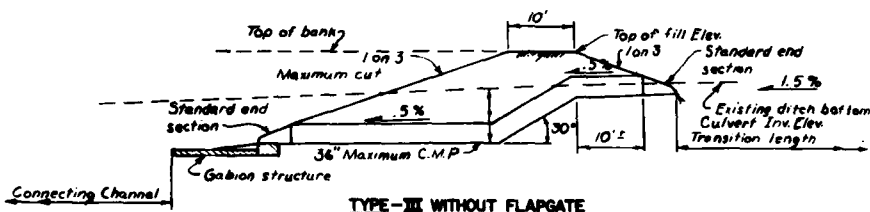
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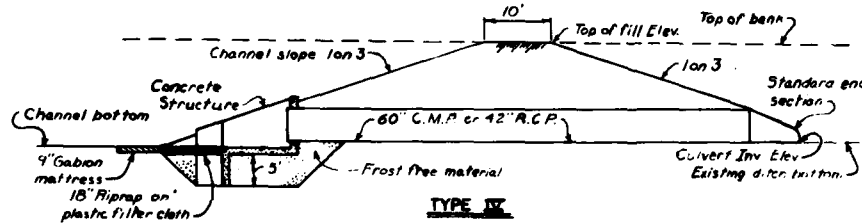
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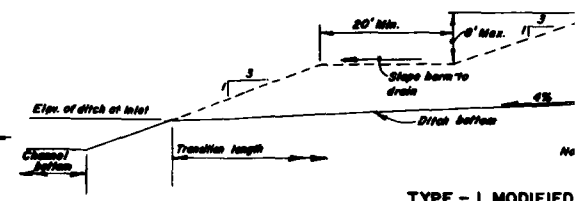
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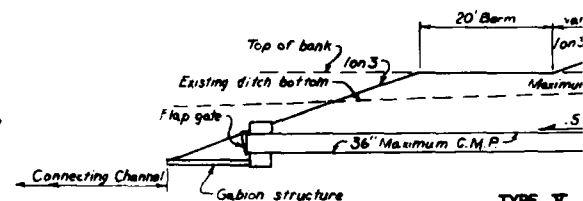
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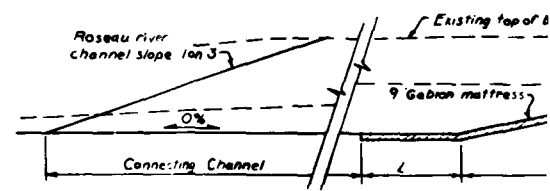
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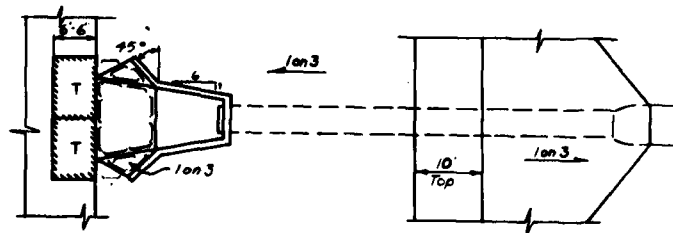
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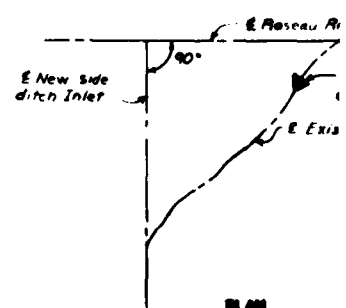
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**TYPE VI GABION FLAP**  
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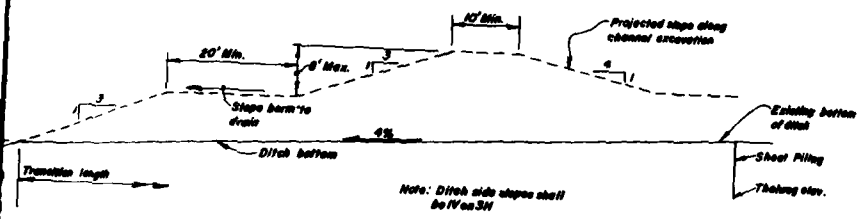


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(1 REQ'D)

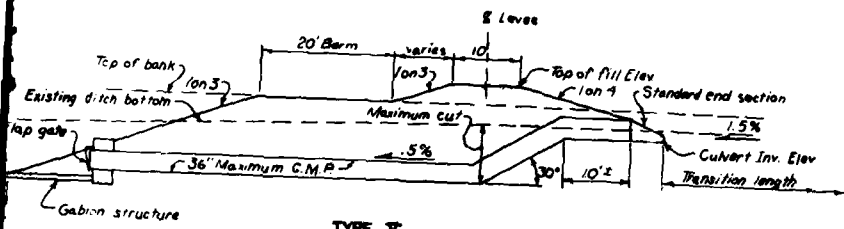


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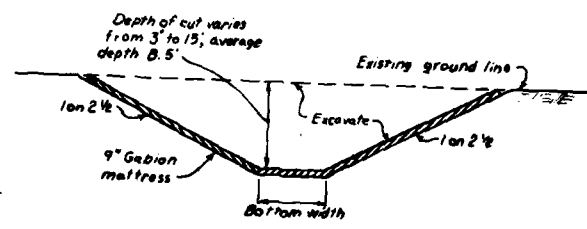




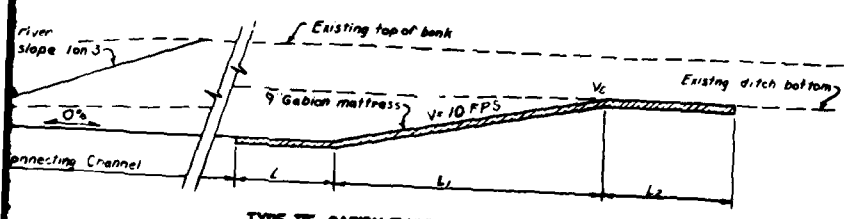
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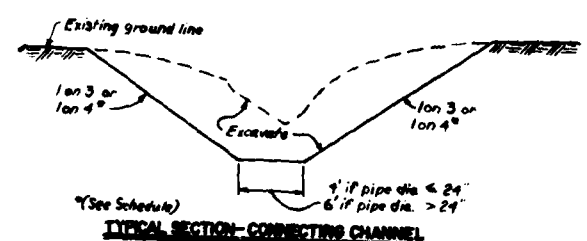
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**TYPICAL SECTION - GABION FLUME**  
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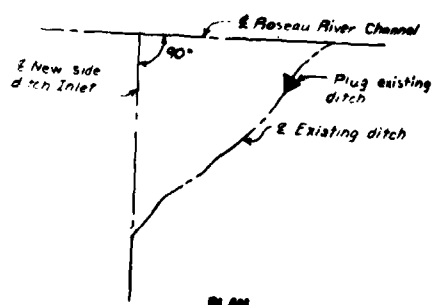


**TYPE III GABION FLUME**  
(10 REQ'D)



**TYPICAL SECTION - CONNECTING CHANNEL**  
NO SCALE

NOTE:  
For some of channel plugs, See Exhibit B.



**PLAN**  
**TYPE III**  
(1 REQ'D)  
NO SCALE

2



DEPARTMENT OF THE ARMY IN THE DISTRICT CORPS OF ENGINEERS AT MILWAUKEE		DATE	APPROVED
GENERAL DESIGN MEMORANDUM FLOOD CONTROL ROSEAU RIVER, MINNESOTA			
DETAILS OF DITCH & DITCH INLETS			
SUPPLEMENT 2		DATE: MAY 1960	
DRAWN BY: [Signature]		CHECKED BY: [Signature]	
SCALE: 1" = 10' - 0"		SHEET NO. 1	





# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

AFA-SE

NOV 30 1979

Colonel William D. Badger  
District Engineer  
U. S. Army Engineer District  
St. Paul  
135 U. S. Post Office and  
Custom House  
St. Paul, MN 55101

Dear Colonel Badger:

Reference your letter of November 16, 1979, NCSED-ER. I have reviewed the biological assessments you sent for the following St. Paul District projects:

Section 107 - Small Boat Harbors

Grand Portage, Minnesota  
Lake City, Minnesota  
Washburn, Wisconsin  
Ashland, Wisconsin

Cook County  
Wabasha County  
Bayfield County  
Ashland County

Section 103 - Beach Erosion

Ashland, Wisconsin  
Two Harbors, Minnesota

Ashland County  
Lake County

Section 14 - Emergency Bank Stabilization

Mahnomen, Minnesota

Mahnomen County

Section 111 - Mitigation for Shore Damage

Big Bay, Michigan

Marquette County

Construction

Roseau River, Minnesota

Roseau and Kittson Counties

I concur with your "not likely to affect" decisions on all projects with the exception of the construction project on the Roseau River. Roseau County, Minnesota has supported an active eagle nest in the past, but presently this once active territory has been abandoned. My concern is

EXHIBIT 9



the destruction of potential nesting habitat along the river within the project area. I therefore suggest you conduct an eagle survey prior to any construction that might be initiated between February 1 and August 15. If evidence of eagle nesting is found please contact the Region 3 Endangered Species Office at 612-725-3596.

Sincerely yours,

*Charles A. Hughlett*

Charles A. Hughlett  
Acting Regional Director



SHYNE/bq/7771

MOSED-ER

23 December 1979

Mr. Harvey Nelson  
Regional Director  
U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55411

Dear Mr. Nelson:

Mr. Charles A. Nuggett's letter (File: AFA-SM) of 30 November 1979 expressed concern over the loss of potential eagle nesting habitat within the Roseau River project area.

We share your concern for the bald eagle but believe that the eagle would not be affected by the project in spite of the reduction in riparian vegetation resulting from construction. Most of the proposed channel excavation would occur on only one bank, leaving more than 50 percent of the trees intact. Trees would be planted to replace some of those lost to construction. In addition, the belt of riparian trees along the river is not continuous through the project area. Most of the reaches with adequate nesting trees adjoin extensively cultivated areas with a high likelihood of human disturbance. The area known as the Big Swamp has a low population density and low potential for disturbance but few mature trees because of soil and moisture conditions and tree removal conducted during channelization in past years.

That nesting conditions for eagles are less than optimum may be confirmed by our review of field observations. The Fish and Wildlife Service has no record of active territories in the project area, and no sightings of bald eagles have been made by or reported to the Minnesota DNR. No eagles were observed during field surveys (conducted for the environmental impact statement) by the Institute for Ecological Studies of the University of North Dakota, Grand Forks. Finally, biologists from the Corps, the Minnesota DNR, and the Fish and Wildlife Service saw no evidence of bald eagle activity during several aerial and river surveys within the past 2 years.

I appreciate your concern about habitat for the bald eagle. The planned one-bank channel excavation was designed to preserve as many trees as possible. In addition, coordination is continuing between the Corps, the Fish and Wildlife

EXHIBIT 10



MOSEL-ER  
Mr. Harvey Nelson

20 December 1979

Service, and the Minnesota DNR to reduce the impact of the project on the aquatic community as much as possible and to mitigate damages to terrestrial habitat.

In view of the reasons presented above, I believe that bald eagles do not nest in the project area and that a bald eagle survey would not be likely to yield any information to the contrary. We will, of course, continue to look for any evidence of eagles during all of our activities in the project area.

If you disagree with this analysis, please provide us with guidance regarding the parameters and frequency of sampling which would meet your requirements.

Any questions that you may have may be directed to John Payne of the Environmental Resources Branch at 725-7771.

Sincerely,

WILLIAM W. BADGER  
Colonel, Corps of Engineers  
District Engineer





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN ONLY REFER TO:  
AFA-SE

JAN 7 1990

Colonel William D. Badger  
District Engineer  
U. S. Army Engineer District  
St. Paul  
1135 U. S. Post Office and  
Custom House  
St. Paul, MN 55101

Dear Colonel Badger:

I have reviewed your December 20, 1979 letter (NCSSED-ER) of explanation regarding the Roseau River project and its possible effect on the bald eagle. We were well aware that the river within the project area is not being used by nesting eagles at the present time and that nesting conditions for most reaches are less than optimum. Our concerns, however, are not only for the possible future use of this marginal area by the bald eagle but also for the loss of 50 percent of the riparian habitat along 46 miles of river. The direct and indirect cumulative and long term effects of projects of this magnitude must be considered in our evaluation.

It does appear that your concerns for this species have been considered during project planning, in that some of the trees lost to construction would be replaced by planting.

In view of the number of aerial and river surveys conducted within the project area within the past two years and with your assurance that you will "continue to look for any evidence of eagles during all of your activities in the project area" I will waive the former request for an additional eagle survey at this time. If through future project investigations, planning, or construction you find any listed species in the area, please re-initiate consultation by notifying this office.

This letter provides comment only on the endangered species aspect of the project. Comments on other aspects of the project under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.) may be sent under separate cover.

Sincerely yours,

*Charles A. Hugstaff*

Charles A. Hugstaff  
Acting Regional Director

EXHIBIT 11



**APPENDIX B**

**404(b)(1) EVALUATION**



APPENDIX B  
404(b)(1) EVALUATION OF THE  
ROSEAU RIVER FLOOD CONTROL PROJECT  
ROSEAU AND KITTSOON COUNTIES, MINNESOTA

The following is an evaluation of the proposed construction and fill activities in accordance with the requirements of Section 404 of the Clean Water Act of 1977 (Public Law 95-217).

1. PROJECT DESCRIPTION

Flood control would be achieved along the Roseau River in Roseau and Kittson Counties, Minnesota (Exhibit 1), by increasing the channel capacity through widening 43.9 channel miles, primarily along one bank. The project also includes 5 miles of channel cutoffs to bypass 11-3/4 miles of river channel during high flows, nine structures to divert low flows through the existing channel at the cutoffs, two levees, side ditch outlet control structures, permanent plugs in six and temporary plugs in five channel loops cut off by previous channelization, riprap protection of bridge embankments, placement of dredged material in two locations to facilitate the development of waterfowl impoundments, and 58 structures to improve fish habitat where the channel bottom is altered (Exhibit 2).

a. Description of the proposed discharge of dredged or fill materials

The major discharge of dredged material would be the disposal of material excavated from the channel bank into wetlands along the river channel in the areas known as Big Swamp and Roseau Lake. Fill material would be placed at most of the outlets of 87 side ditches, in one bypass channel which would be constructed in a wetland, in 11 oxbow loops, on all bridge embankments, and in the channel for fish habitat structures.

(1) General characteristics of material - Material produced by channel excavation would be river bottom sediments and channel bank soils consisting of sandy-gravelly clays and silts in the Big Swamp; plus peat and fine sands, clays, and silts in the bed of Roseau Lake. Side ditch and bridge protection would be accomplished with gabion baskets and/or rock fill over plastic filter-cloth. The channel diversion structure would be constructed of gabion baskets, filled with rocks, with fill placed over a gravel bed in the excavated cutoff channel. Approaches would be protected with riprap. Oxbow plugs would be constructed of excavated material similar to that listed above for Big Swamp. Fish habitat structures would be composed of clean washed gravel and rubble on the channel bottom plus rock riprap on banks and rocks in gabion baskets in the channel and on the banks.

(2) Quantity of material proposed for discharge - The discharge of excavated material into wetlands would include all material removed for channel widening and deposited along the river on one side from T163N, R42W, Section 30 to T163N, R44W, Section 7 (approximately 14.5 miles), and along both sides of a new cutoff channel from T163N, R39W, Section 22 to T163N, R40W, Section 19 (approximately 3 miles). The amount of material to be discharged in the Big Swamp reach is approximately 1,355,777 cubic yards; approximately 698,824 cubic yards would be placed in the Roseau Lake reach. An additional 84,374 cubic yards would be placed in wetlands in the 3-mile reach downstream of the



lower limit of Big Swamp. Sufficient riprap, gabions, and filtercloth would be used to protect the ditch outlets and nine bridges. The amount of material required for fish habitat structure construction cannot be determined until the structures are designed. Temporary channel plugs would be placed in five inlets, and permanent plugs would be placed in six inlets and outlets of abandoned channel loops, requiring approximately 4,700 cubic yards of excavated material. Construction of the diversion structure would require 1,850 cubic yards of rock, gravel, and fill material.

(3) Source of material - All earthen fill would be excavated from the channel bottom and banks. Where sufficient material would not be available from the river channel, material would be borrowed from land adjacent to the placement site. The source of rock fill has not yet been identified. Field piles may be used, if suitable. Rock, gravel, and rubble material excavated from the river channel would be used, where suitable, after washing or screening.

b. Description of the proposed disposal sites for dredged or fill material

(1) Location - Locations of fill activities are indicated in Exhibit 2. Fish habitat structures are shown at tentative locations. Several of the structures are planned to be installed early in project construction. After observing the functioning of these structures, it may be found beneficial to alter the design and/or location of the rest of the structures. Some may be relocated to avoid bank stability problems. Additional investigations will be conducted during the preparation of plans and specifications.

(2) Type of disposal sites - Material excavated from the channel would be placed in discontinuous piles along the project right-of-way in wetland areas downstream of Big Swamp, through the Big Swamp and the south bank of Cutoff 8, and in continuous piles on the north bank of Cutoff 8 and the south bank at Badger Creek. Wetlands to be impacted are primarily a mixture of Type 2 (meadow), Type 3 (shallow marsh), and Type 6 (shrub swamp) as well as a 6-acre Type 4 (deep marsh) in the Big Swamp area; and Type 1 (seasonally flooded basin) and Type 2 (meadow) in the Roseau Lake area. Ditch inlet and bridge embankment protection would be placed on channel banks. Fish habitat structures would be placed on the channel bottom. A diversion structure would be placed on the bottom of a newly excavated channel in Cutoff 8. Plugs would be placed in oxbows, i.e., channel loops isolated by previous channelization activity which are now a mixture of Type 3 (shallow marsh) and Type 4 (deep marsh) wetlands.

(3) Method of discharge - Excavated material would be placed by dragline and shaped, if necessary, by machinery. Rock fill and riprap would be placed by crane or front-end loader. Channel plugs would be placed similarly or by the dragline.

(4) When will disposal occur? - Disposal would occur during 4 construction seasons beginning in 1982.

(5) Projected life of disposal sites - The projected life of the project is 50 years.

(6) Bathymetry - The placement of excavated material, channel plugs, and riprap bank protection would have little, if any, effect on water depths. The diversion structure would maintain depths in a section of the existing channel at low flows. Only high flows would pass down the new cutoff. Fish habitat structures would be placed to provide variations in water depth and current



velocity for the benefit of the fishery resources. Plugs would increase water depths year-round in the oxbows.

## 2. PHYSICAL EFFECTS (40 CFR 230.4-1 (a))

### a. Potential destruction of wetlands - effects on (40 CFR 230.4-1 (a)(1) (i-vi))

The oxbow plugs, one diversion structure, and approximately 2 million cubic yards of excavated material would be placed in wetlands.

(1) Foodchain production - Oxbow plugs would be placed to provide increased opportunities for waterfowl production. These areas presently flood during high water and retain some water in deeper portions throughout the year. The main value of these areas would be for waterfowl and aquatic fauna adapted to temporary water habitats since no overwintering would be likely in such shallow areas with no year-round water supply. Wetland areas that would receive excavated material are isolated from the river and would be used by most aquatic organisms only during high water years. Areas covered by dredged material would no longer produce vegetation suitable for waterfowl. The diversion structure would maintain normal low flows in the existing river channel, allowing continued production of the aquatic foodchain.

(2) General habitat - Wetland areas receiving fill would essentially change to upland habitat due to the height of the disposal piles. The area to be covered would amount to 366.1 acres. Oxbow plugs would change the oxbow habitat from Type 2 (meadow) and Type 3 (shallow marsh) to Type 4 (deep marsh). The diversion structure would maintain habitat in the river.

### (3) Nesting, spawning, rearing, and resting sites for aquatic or land species.

(a) The wetland areas that would be filled are a mixture of meadows, shallow marsh, deep marsh, and shrub swamp (Types 2, 3, 4, and 6, respectively) dominated by sedge meadow. Areas receiving the fill would be eliminated as nesting and feeding areas for waterfowl. The area would be available for use by spawning fish only in years when overbank flooding takes place. The area receiving the fill would be elevated and experience a change in vegetation type. It would no longer be suitable for fish spawning or egg development since northern pike, the predominant marsh-spawning species, require flooded vegetation to spawn. Breaks in the disposal sites in the Big Swamp reach may allow fish passage to areas landward of the disposal piles.

(b) Waterfowl currently use the oxbows for nesting, feeding, and resting. The plugs are intended to provide increased water area and some measure of control over water depth so that these areas could be managed for increased waterfowl utilization. Any fish that would enter these oxbows to spawn would be trapped. Spawning would likely be successful, and some forage fish and invertebrates might be available to support the juvenile fish. However, the oxbows would be relatively shallow and nutrient-rich, and would have no continuous fresh water supply. These areas are not expected to support fish over winter. Other oxbows with better water supply and depth would be left open to continue providing areas for both fish spawning and waterfowl nesting. The diversion structure would maintain a portion of the river in its present state so that current levels of nesting and spawning can continue. To reduce adverse effects of placing fill materials in the Type IV wetland, a new wetland area would be excavated in the immediate vicinity. The size and configuration of the excavation would be designed to provide for optimal waterfowl use.



(4) Those areas set aside for aquatic environment study or sanctuaries or refuges - Most of the wetland fill and all of the oxbow plugs would be placed within the Minnesota Department of Natural Resources Wildlife Management Area. This area is managed for wildlife production (primarily waterfowl), public hunting, and trapping. Sanctuary areas are contained within the management area, but none would be affected by the proposed activities.

(5) Natural drainage characteristics - Disposal piles of excavated material, except where placed for future waterfowl impoundment development, would be discontinuous to reduce the interruption of natural drainage patterns. Some ponding may occur, depending on the frequency of interruptions in the piles. The oxbows would be plugged to retain water entering them in the spring. The diversion structure would route river flow through the existing channel.

(6) Sedimentation patterns - The effect of these activities on sedimentation patterns is unknown. The Roseau River normally has a low sediment load, but this would increase during the 4-year construction period due to bank excavation. An increase in sediment deposition would be expected in the upstream ends of the plugged oxbows.

(7) Salinity distributions - Not applicable.

(8) Flushing Characteristics - The placement of fill would have no appreciable effect on the flushing characteristics of wetlands in the Roseau River watershed.

(9) Current patterns - Wetland fill would not be placed in areas influenced by water currents. Oxbow inlets are presently elevated and only interrupt current distribution during spring runoff and other high-flow periods. As a result of the installation of plugs, more water would be conducted down the river channel. The diversion structure would pass low flows down the river, high flows through the diversion channel.

(10) Wave action, erosion, or storm damage reduction - The proposed fill activities would not ordinarily be influenced by nor affect wave action or storm damage reduction. Erosion would not increase substantially as a result of this activity. Vegetation plantings and other protection, as required, would prevent increases in erosion.

(11) Storage areas for stormwaters and floodwaters - The Big Swamp area, which would receive excavated material, functions to retard downstream floodwater peaks through retention of overbank flooding. The project has been designed to insure that this would continue. Roseau Lake formerly retained floodwaters; and although the pool has been drained, it still fills during high-flow years. This flooding would be reduced under the proposed plan.

(12) Prime natural recharge areas - No prime natural recharge areas would be affected by project fill activities.



b. Impact on water column (40 CFR 230.4-1 (a)(3))

(1) Reduction in light transmission - The placement of oxbow plugs and wetland fill is the only activity which has the potential to reduce light transmission in the water column. Measures would be taken to minimize the runoff of sediment by planting vegetation or installing bank protection.

(2) Aesthetic values - Fill would generally not be placed in open water. In some areas where riprap would extend below the water surface, an unnatural appearance would reduce aesthetic values. The diversion and fish habitat structures would appear to be man-made.

(3) Direct destructive effects on nektonic and planktonic populations - The placement of fill material would have little effect on planktonic or nektonic populations since most fill would not be placed directly in open water. The fish habitat structures would displace small numbers of organisms but would not have significant destructive effects.

c. Covering of benthic communities (40 CFR 230.4-1 (a)(3))

(1) Actual covering of benthic communities - Some portions of existing benthic communities would be covered by excavated material, oxbow plugs, fish habitat structures, and ditch outlet and bridge embankment protection. A net gain in benthic habitat would result from the increased water levels in the oxbows and the increased surface area and interstitial spaces created by the riprap. Areas receiving fill from channel excavation would be primarily sedge meadow and would not be expected to have permanent benthic communities. Slightly deeper areas may contain seasonal benthic communities which would be covered by fill. The fill activity itself would not have a significant adverse effect on existing benthic communities.

(2) Changes in community structure or function - No substantial changes in benthic community structure or function would be expected to result from the discharge activities of this project. The majority of the discharged material would not be placed in areas having benthic communities.

d. Other effects (40 CFR 230.4-1 (a)(3))

(1) Changes in bottom geometry and substrate composition - Bottom geometry would be altered at the inlets and outlets of five oxbows and in areas where fish habitat structures would be placed. The purpose of the fill placement for fish habitat structures would be to alter the bottom geometry, thereby altering depths and velocities. Localized substrate changes may occur where this fill would be placed, but one purpose of the placement would be to replace habitat removed by construction. Oxbow plugs and wetland fill would not change substrate composition since the excavated material would be similar to that at the placement site. Bottom geometry in the wetlands would be altered to dry upland where fill material is placed.

(2) Water circulation - Water circulation would not be appreciably affected, except where oxbow plugs would restrict circulation and impound the water.

(3) Salinity gradients - Not applicable.

(4) Exchange of constituents between sediments and overlying water with alterations of biological communities - Rock and gravel materials would not contain constituents that would exchange with water. Excavated material would not be placed in water, and sediments in channel exposed by excavation are not expected to be polluted.



3. CHEMICAL-BIOLOGICAL INTERACTIVE EFFECTS (40 CFR 230.4-1 (b))

a. Does the material meet the exclusion criteria?

(1) The exclusion criteria state that dredged or fill material may be excluded from further evaluation if the material is composed primarily of sand, gravel, or any other naturally occurring sedimentary material with particle sizes larger than silt, characteristic of and generally found in areas of high current or wave energy.

(2) Alternatively, material may meet the exclusion criteria when: (a) the material proposed for discharge is substantially the same as the substrate at the proposed disposal site; (b) the site from which the material proposed for discharge is to be taken is sufficiently removed from sources of pollution to provide reasonable assurance that such material has not been contaminated by such pollution; and (c) adequate terms and conditions are imposed on the discharge of dredged or fill material to provide reasonable assurance that the material proposed for discharge will not be moved by currents or otherwise in a manner that is damaging to the environment outside the disposal site.

(3) Gravel and rubble, rock fill for gabions, and riprap would be composed of particle sizes larger than silt and would be products of glacial deposition. This material would meet the exclusion criteria in category (1) above. Material to be placed in wetlands and oxbows would be primarily from the riverbank and would be substantially the same as the adjacent soil of the placement site. The exception would be river bottom silts, but these would generally be excavated first and contained within the disposal pile. The upstream reach (Roseau Lake) would be approximately 7 miles from the nearest pollution point source, the city sewage outfall. The downstream reach (Big Swamp) would be about 16 miles from the source. These distances are considered sufficiently removed in distance, particularly since stabilization ponds are used to reduce contamination of the river. River bottom materials were not considered to be contaminated by any non-point source of pollution since no pesticides were detected in U.S. Geological Survey sediment samples taken 6 miles below the end of the downstream fill area. Finally, a substantial amount of the material would be excavated dry and be placed only where foundational stability was adequate, and vegetation to control erosion would be planted soon after placement. Thus, material to be placed in wetlands and oxbows would meet all three exclusion criteria in category (2) discussed above. According to the exclusion criteria, no further evaluation of dredged and fill material would be necessary.

4. DESCRIPTION OF SITE COMPARISON (40 CFR 230.4-1 (c))

a. Total sediment analysis (40 CFR 230.4-1 (c)(1)) - No total sediment analysis has been conducted. However, U.S. Geological Survey sediment samples at Caribou (6 miles downstream of the end of the fill area) had no pesticide levels above detectable limits. No toxic materials are expected to be in the sediment of this remote area. In addition, none of the excavated material would be placed in water, and excavation techniques would place river bottom materials at the bottom center of the disposal pile surrounded by clay. Immediate planting of vegetation would help prevent erosion of the disposal piles.

b. Biological community structure analysis (40 CFR 230.4-1 (c)(2)) - Stream survey data concerning the structure of the biological community were gathered for the assessment of project impacts and are contained in the Final Environmental Impact Statement.



5. REVIEW APPLICABLE WATER QUALITY STANDARDS

a. Compare constituent concentrations

Water quality in the Roseau River is generally good. Pesticides, the most likely contaminants, are below detectable limits.

b. Consider mixing zone

No discharge of liquid would result from disposal activities.

c. Based on a. and b. above, will disposal operations be in conformance with applicable standards?

Fill activities would be in conformance with Minnesota State Standards. Turbidity standards may be exceeded during placement of wetland fill and oxbow plugs, and during construction of diversion structures. Measures would be taken to minimize increased turbidity.

6. SELECTION OF DISPOSAL SITES (40 CFR 230.5) FOR DREDGED OR FILL MATERIAL

a. Need for proposed activity

Ditch inlet and bridge embankment protection would be required to control erosion and sedimentation. Diversion structures, riffle, fish habitat structures, and oxbow plugs would be required to reduce project-induced losses. Placement of fill in wetlands would be required for the disposal of material excavated to widen the river channel.

b. Alternatives considered

(1) There would be no alternatives to ditch inlet and bridge embankment protection if the proposed plan were implemented since considerable bank erosion and sedimentation in the channel would be expected if these measures were not provided.

(2) If cutoff diversion structures were not installed, sedimentation and stagnation of channel loops would cause the formation of oxbow lakes, resulting in a substantial reduction in the value of the loops to the aquatic community. Elimination of fish habitat structures and oxbow plugs would provide no reduction of project-induced impacts.

(3) Fill intended for placement in wetlands could be hauled to upland disposal sites. It is presently proposed that excavation in the Big Swamp be accomplished by a dragline placed on mats. No road construction is planned. Hauling the fill to an upland site would require the construction of a heavy-duty haul road through the Big Swamp. Construction of a haul road would have impacts roughly equivalent to fill placement due to the amount of material required, although the road could be removed, reducing the damage somewhat.

(4) Excavated material could also be removed by hydraulic dredging and transported by pipeline and booster pumps to two upland diked disposal sites, one at each end of the Big Swamp reach. About 5 to 7 miles of pipeline would be required, and large retention basins would be needed to provide for



separation of water and sediment. Machinery access would be considerably better in Roseau Lake. Excavated material could be loaded and hauled to an upland disposal site.

(5) The Type 4 wetland in Big Swamp could be avoided by excavating on the opposite bank. However, adoption of this alternative would eliminate the possible future construction of a waterfowl impoundment by the Minnesota Department of Natural Resources.

c. Objectives to be considered in discharge determination (40 CFR 230.5 (a))

(1) Impacts on chemical, physical, and biological integrity of aquatic ecosystem - Clean fill would not cause any significant impact on the integrity of the aquatic system. Physical changes would be made to reduce the impact of channelization on the biological integrity of the system. Wetland fill would impact the physical and biological integrity of the wetlands by changing these areas to upland with a resultant change in habitat and vegetation types.

(2) Impact on foodchain - It is expected that impacts on the foodchain caused by channelization would be partially offset by fill activities (fish habitat structures and riprap) that provide substrate for invertebrate and algal production. Wetland fill would eliminate areas from the wetland food-chain by replacing them with habitat for upland animals and vegetation.

(3) Impact on diversity of plant and animal species - No substantial impact on plant and animal diversity would be expected as a result of fill activities. Impacts would be localized at each site of placement and would not affect large areas.

(4) Impact on movement into and out of feeding, spawning, breeding, and nursery areas - Fish movement out of six oxbows used in years of high discharge for spawning and nursery areas would be blocked. The outlet plugs would have drawdown capability and fish that entered to spawn could be released, if desired. However, that would not be compatible with the intended purpose of waterfowl management. Other oxbows would remain available for fish spawning. Fish habitat structures would provide feeding areas and cover for young fish. Diversion structures would insure accessibility of non-modified channel loops to fish that would spawn at times other than high runoff periods.

(5) Impacts on wetland areas having significant functions of water quality maintenance - Water quality functions of wetlands not directly affected by fill would continue after project construction. Although flood duration would be reduced, the amount of overbank and overland flow would remain approximately the same.

(6) Impacts on areas that serve to retain natural high waters or floodwaters - The Big Swamp is an area that serves to retain floodwaters. The placement of disposal sites would be designed to insure that this function continues at its present capacity. Retention in the Roseau Lake basin would be reduced by the project.

(7) Methods to minimize turbidity - Fill activities would have negligible long-term effects on turbidity levels. The majority of the material would be dry and seeded with vegetation to minimize erosion.

(8) Methods to minimize degradation of aesthetic, recreational, and economic values - Aesthetic values would be reduced by most fill activities where riprap, artificial structures, or wetland fill would be placed. Vegetation plantings would somewhat offset the visual impacts of disposal piles.



No measures would be applicable to other cases. The diversion structure would function to preserve the aesthetic and recreational values of a reach of existing river channel. Oxbow plugs would preserve recreational values at their locations.

(9) Threatened and endangered species - None of the proposed activities would be expected to adversely impact endangered or threatened species since none presently inhabit or utilize the project area.

(10) Investigate other measures that avoid degradation of aesthetic, recreational, and economic values of navigable waters - Alternative methods for the disposal of excavated material that would lessen impacts on these values are discussed in Section 6.b.

d. Impacts on water uses at proposed disposal site (40 CFR 230.5 (b)(1-10))

(1) Municipal water supply intakes - No municipal water supply intakes are located within the proposed project area.

(2) Shellfish - Shellfish and their habitat would be buried in areas where fish habitat structures were placed. Bank stabilization could cover habitat where it is placed below the waterline. Other activities would have no effect.

(3) Fisheries - The placement of fish habitat and diversion structures would be done to offset a small amount of the fisheries losses resulting from channel modification. Oxbow plugs would reduce but not eliminate access to six oxbows; however, fish that enter would be trapped and would not survive over winter unless active management accomplished a fall drawdown to remove fish. Other, more suitable, oxbows would be left open for fish spawning.

(4) Wildlife - Waterfowl use of Oxbows 2 to 7 would be facilitated by the placement of plugs. Diversion structures would preserve low flows in the existing channel and allow continued waterfowl use. The placement of fill in wetlands would eliminate, by covering, a quantity of waterfowl feeding and nesting habitat. Other fill measures would not affect water uses by wildlife.

(5) Recreation activities - The diversion structure would partially maintain portions of the existing channel and permit continued fishing and watercraft use. Oxbow plugs would offset some loss of waterfowl productivity and reduce the loss of hunting opportunities caused by the placement of fill in wetlands. The placement of fish habitat structures would offset some of the fisheries losses caused by the project. Other fill activities would have no impact on recreation.

(6) Threatened and endangered species - None of the fill activities would affect use of water by any of the threatened or endangered species whose range includes the project area.

(7) Benthic life - Placement of fill in wetlands would not affect benthic life in the river since the wetlands are not contiguous with the river channel. Benthic organisms and their habitat could be destroyed by burial in the deeper wetlands that would support benthic communities. Fill activities utilizing rock, rubble, and gravel would provide habitat for invertebrates; however, some invertebrates might be lost by burial when material is placed. Species composition on the fill could be somewhat different from that on the present river bottom.



(8) Wetlands - The type of wetlands contained in the plugged oxbows would be altered from meadow and shallow marsh to deep marsh. Wetland areas receiving fill material from channel excavation would change to upland, dry habitat at the fill site.

(9) Submersed vegetation - Small amounts of submersed vegetation may be destroyed by fill placement in oxbows, ditch outlets, and bridge embankments. Fish habitat structures could cause some loss of vegetation, but these would not normally be placed directly in areas having concentrations of submersed plants.

(10) Size of disposal site - For most categories, the disposal site would be no larger than that necessary to accomplish the desired result. Wetland fill for future waterfowl impoundments would require essentially continuous strips in two locations instead of the discontinuous piles used elsewhere.

(11) Coastal Zone Management Programs (40 CFR 230.3 (e)) - The proposed project would have no effect on Coastal Zone Management Programs.

e. Considerations to minimize harmful effects (40 CFR 230.5 (c)(1-7))

(1) Water quality criteria - Clean rock, gravel, and rubble, and plastic filtercloth would be the only materials placed in open water. Outside the river channel, river bottom and bank material would be used for oxbow plugs and diversion structures. It is expected that only turbidity criteria would be exceeded, but only temporarily, during the placement of plugs and diversion structures.

(2) Investigate alternatives to open water disposal - Riprap and plastic filtercloth would be placed at side ditch outlets and bridge embankments for erosion control. Fish habitat structures would be placed to reduce fishery impacts. No alternatives are available which would provide the desired protection or offset habitat losses.

(3) Investigate physical characteristics of alternative disposal sites - Wetland fill of excavated material would be the only activity for which alternative disposal sites would be considered. No specific sites have been identified, but non-wetland alternative sites would, of necessity, be over 5 miles (on either side) from the center of the Big Swamp reach where fill would be placed. The upland disposal sites would likely be agricultural land either under cultivation or in use as pasture.

(4) Ocean dumping - Not applicable.

(5) Where possible, investigate covering contaminated dredged material with cleaner material - The dredged material is not expected to be contaminated. The probable method of excavation would be to place river bottom material near the base and/or center of the disposal pile and to cover it with dry riverbank material.

(6) Investigate methods to minimize effect of runoff from confined areas on the aquatic environment - It is not expected that hydraulic dredging or confined disposal would be required, and little runoff is expected. Disposal piles would be seeded as soon as possible to minimize erosion.



(7) Coordinate potential monitoring activities at disposal site with EPA - Monitoring activities would not be required at disposal sites due to the clean nature of the materials.

7. STATEMENT AS TO CONTAMINATION OF FILL MATERIAL IF FROM A LAND SOURCE (40 CFR 230.5 (d))

Fill material from land sources may consist of washed gravel and stone. The stone would come from quarries or from farmers' field piles. None of this material is likely to be contaminated.

8. DETERMINE MIXING ZONE

Not applicable. Fill material would be non-liquid.

9. COORDINATION

The Draft Supplement to the Final EIS was mailed to Federal, State, and local government agencies and the general public on 27 June 1980. Comments which were received during this coordination and changes have been made to this document in response to these comments. No request for a public hearing was received.

10. DETERMINATIONS

a. An ecological evaluation has been made following the evaluation guidance in 40 CFR 230.4. A Supplement to the Environmental Impact Statement has been prepared to evaluate changes made to the project to reduce its impacts. Evaluation considerations of 40 CFR 230.5 were also examined in conjunction with the Final EIS and Supplement to select suitable sites and methods of disposal.

b. Appropriate measures have been identified and incorporated in the proposed plan to minimize adverse effects on the aquatic environment as a result of the discharge (40 CFR 230.3(d)(1)). Excavation would be limited to one side only. Six miles of channel at the downstream end of the project and 10 percent of the next 12 miles upstream would be excavated to leave a minimum of 2 feet of the riverbank undisturbed on the excavated side. An additional 11-3/4 miles of river channel would be left undisturbed through the construction of high-flow bypass channels. Disposal piles would be limited in width to that necessary for stability. Excavated material would be planted with grasses as soon as possible after placement to control erosion. The outlets of all ditches entering the river would be fixed to prevent additional drainage. Oxbows would be plugged to provide improved waterfowl habitat. Structures would be placed in the river to provide fish and fish forage habitat.

c. In the Supplement to the Final EIS and this 404(b)(1) Evaluation, consideration has been given to the need for the proposed activity, which is to reduce the duration of flooding along the Roseau River. Eliminating channel excavation and the resultant fill would not accomplish this purpose. No suitable alternatives would be available. Erosion control measures would be employed



where excavated materials would be placed. Clean rock would be used for rip-rap and structures. Water quality, except for a possible short-term increase in turbidity, would not be diminished by fill activities (40 CFR 230.5).


d. Wetlands (40 CFR 230.5(b)(8))

The activity associated with the fill must have direct access to the water resource to fulfill its basic purpose. The proposed fill and the activity associated with it will not cause permanent unacceptable disruption to the beneficial water quality uses of the affected aquatic ecosystem.

11. FINDINGS

I find, based upon the above determination, that the discharge sites for the Roseau River Flood Control Project have been specified through the application of the Section 404(b)(1) guidelines.

9 Sep 81  
DATE

  
WILLIAM W. BADGER  
Colonel, Corps of Engineers  
District Engineer



**APPENDIX C**  
**COORDINATION LETTERS**





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

LWR

JUN 16 1977

Colonel Forrest T. Gay III  
District Engineer  
U. S. Army Engineer District  
St. Paul  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Gay:

This letter concerns the Roseau River Flood Control Project in Roseau County, Minnesota, and southern Manitoba, Canada.

During the past eight months the U. S. Fish and Wildlife Service has been re-evaluating the Roseau River Flood Control Project. Since the project has already undergone Federal agency review, we believe that an explanation is appropriate regarding the circumstances leading to our reinvolvement in this matter. In November 1976, the Service received from your agency an advance copy of the Final EIS. At the same time, our agency became aware of a growing public concern for the environmental impacts, alternatives and fish and wildlife mitigation measures for the project. Thus, we began reevaluating previous reports and collected new data because the short and long-range environmental impacts appeared substantially greater than those known and reported to Congress which culminated with the authorization of the project in 1965. Our reevaluation included an in-depth reassessment of data from the Soil Conservation Service, International Joint Commission (International Roseau River Engineering Board), U. S. Army Corps of Engineers, U. S. Fish and Wildlife Service and the Minnesota Department of Natural Resources (DNR), resulting in the development of our Special Report dated June 1977.

We are pleased to provide you with a completed copy of our Special Report which is the basis for our subsequent recommendations. Also attached is a copy of a briefing statement on the project.

After consultation and coordination with the Minnesota DNR, and on the basis of existing and new information presented in the attached Special Report, the U. S. Fish and Wildlife Service requests that you consider taking the following actions with regard to the Roseau River Flood Control Project:

1. The portion of the project from the upstream end, through the City of Roseau, Minnesota, downstream to the mouth of Hay Creek (approximately four river miles) could be constructed in accordance with your existing plans. From a fish and wildlife point of view, this portion of the project has not changed and remains essentially the same as known and authorized by Congress in 1965. Consideration of fish and wildlife resources in this stretch is adequate.



2. The portion of the project from the mouth of Hay Creek downstream to the International border (approximately 40 river miles) should be re-authorized for restudy by Congress (through the U. S. Army Corps of Engineers) on the basis that the existing project is substantially different with regard to environmental impacts than was known and presented to Congress for authorization in 1965. A restudy of this portion of the project should consider the full extent of short and long-range environmental impacts in the United States and Canada; consideration of all alternatives including non-structural alternatives under Section 73 of the Water Resources Development Act of 1974; and should provide adequate compensation for the direct and indirect adverse impacts on fish and wildlife resources in the United States and Canada.

Our position with regard to restudy is based primarily on the following major points (summarized from the Special Report):

- New information is available indicating that the project could cause a substantially greater adverse environmental impact than was known and presented to Congress for authorization in 1965, and as stated in the Corps of Engineers' Final EIS (advance copy). Although not within our expertise, the potential for the project to facilitate significant increases in wetland drainage could also change the hydrological assumptions, profile and impacts in the project area.
- The potential for violating Articles II, IV, and IX of the Boundary Waters Treaty of 1909 between the United States and Canada has substantially increased. We do not believe the local sponsor (Roseau River Watershed District) or your agency can adequately guarantee full compliance with the Treaty under the proposed project plan with its subsequent potential impacts.
- The International Joint Commission (IJC) Report concludes that, "...maintenance of County Road No. 7 in its May 8, 1964 hydraulic condition is necessary to the successful operation of the Coordinated Plan". Neither the Corps of Engineers nor the local sponsor can effectively control private, small group or major (Public Law 566) drainage of wetlands from new or existing (cleaned) drainage ditches through the Big Swamp-Duxby-Badger-Skunk drainage area. It would appear that this control would be necessary for the success of the Corps project.



- The project provides minimal mitigative measures for the direct losses of fish and wildlife habitat in the United States. No mitigation is provided for the potential indirect losses in the United States or any losses in Canada. The Service, however, does not believe the present project can be mitigated due to the extent of direct and indirect fish and wildlife habitat losses.
- Because of the strong probability for substantially greater indirect adverse environmental impacts, the project is not in compliance with regard to the National Environmental Policy Act of 1969 (consideration of short and long-range environmental impacts, alternatives, and mitigatory measures for anticipated fish and wildlife losses). We believe the Final EIS (advance copy) is inadequate.
- Finally, considerable opposition is occurring from residents within the project area, throughout Minnesota and in Manitoba, Canada. Also, both the Minnesota DNR and Federal Environmental Protection Agency have strong reservations about the project.

The Service recognizes and understands the many diverse problems associated with the Roseau River Flood Control Project. However, we are optimistic that between us an appropriate and reasonable solution can be found to minimize future flood control problems, and also to protect and enhance the area's bountiful fish and wildlife resources for future generations.

Sincerely yours,

*Charles A. Hight*

Charles A. Hight  
Acting Regional Director

#### Attachments

cc:  
Minnesota Department of Natural Resources, St. Paul, MN  
Minnesota Environmental Quality Council  
Senator Hubert H. Humphrey  
Senator Wendell Anderson  
Representative Arlan Stangeland  
National Wildlife Federation (ATTN: Oliver Houck)  
U.S. EPA, Federal Activities Branch, Chicago, IL





# National Wildlife Federation

1412 16TH ST., N.W., WASHINGTON, D.C. 20036

Phone 202-797-6800

June 29, 1977

Colonel Tilford Creel  
Asst. Director of Civil Works  
Great Lakes Division  
Forrestal Bldg.  
Washington, D.C. 20314

Dear Col. Creel:

Enclosed is a copy of the special study recently issued by the U.S. Fish and Wildlife Service (FWS) regarding the proposed Roseau River Flood Control project in northwestern Minnesota and southern Manitoba, Canada. The results of this study indicate that serious, previously unknown problems may attend the proposed project.

According to the report, the Roseau River project would allow the drainage of 237,000 acres of wetlands. This staggering loss of critical waterfowl habitat represents five times the amount of wetland purchased by the FWS under the Federal Wetlands Acquisition Program in Minnesota. According to the FWS, it will be impossible to adequately mitigate the lost habitat. Because the degree of damage was not known when the project was authorized by Congress in 1965, the FWS has recommended that the Corps return the project to Congress for review.

The National Wildlife Federation shares the FWS's deep concern over the habitat destruction threatened by the Roseau River project. The potential exists not only for extensive wetlands drainage, but for serious water quality degradation and increased flooding downstream in Canada, in violation of the Boundary Water Treaty Act of 1909. Secondary drainage which is encouraged by the channel modifications may also negate whatever flood control benefits the project is designed to achieve.

We believe that the questions raised by the FWS merit serious reconsideration, as that agency has suggested. Special attention should be given to non-structural alternative solutions to the problem of agricultural flooding in the Roseau River basin (e.g. crop loss insurance, floodway easements, proper land management). The adoption of such practicable non-structural alternatives is the approach favored by the growing opposition to the existing project among citizens in Roseau County and Manitoba, Canada and by the state agencies responsible for the project. These non-structural alternatives would accomplish the project's flood control objectives without jeopardizing the existence of our dwindling fresh water wetlands.



# National Wildlife Federation

Col. Tilford Creel

-2-

June 29, 1977

In view of the above, the National Wildlife Federation believes that reconsideration is particularly timely now, when no substantial investment has been made.

Sincerely,



THOMAS L. KIMBALL  
Executive Vice President



16 August 1977

Mr. Jack Hemphill  
Regional Director  
U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

Dear Mr. Hemphill:

We have completed our studies relating to the induced drainage connected with our Roseau River flood control project. Inclosed are maps showing the Roseau River basin area, a drawing showing four cross sections across the Roseau River basin, and a drawing showing profiles of the Roseau River and tributaries. The maps show the outline of the Roseau River watershed district, project data, the extent of public land ownership in the Roseau River basin, the extent of cultivated land in the basin and the increase in the hydraulic limit for drainage potential with and without the project, and the location of the four cross sections taken for our studies. The extent of cultivated land was determined by inspection of Department of Agriculture aerial photos taken in 1974.

The following criteria were used to determine the areas that are hydraulically influenced by the Roseau River hydraulic regime and changes to this regime.

- a. Areas at an elevation of 10 to 15 feet above the existing top of river bank are beyond the hydraulic influence of the Roseau River because the backwater effects of existing water depths in the river or drawdown effects of a 1 to 3-foot lowering of the water surface do not extend to those elevations.
- b. In areas near the same elevation as the top of the river channel bank, the current limit of hydraulic influence was determined by extending a profile at a slope of about 1-foot-per-mile from the



MCSED-D  
Mr. Jack Hamphill

16 August 1977

bottom of the river channel to within about 3 feet of ground surface. For each foot that the channel modification would lower a 500 cfs river flow, the modified limit was extended 1 mile beyond the current limit. In several areas, primarily around Badger Creek, it was found that to develop drainage to the limit of current hydraulic influence would require either independent lateral drainage ditch development or modification of the existing lateral drainage system.

Our determination of the area in which project related drainage could occur was based on the amount of privately-owned, non-cultivated land within the area where the hydraulic limit of drainage was extended by the project and within 1-1/2 miles of the river or tributary. We found land satisfying these criteria in the Pine Creek basin in sections 9, 10 and 11, R41W, T 163N and in the Hay Creek basin in sections 3, 4 and 10, R39W, T162N. The total area of probably induced drainage at these two locations is approximately 1,180 acres. This is the amount of land in private ownership which may drain without further ditch construction.

All other lands which might be drained to the Roseau River would require either a change in watershed district boundaries or change in land ownership from public to private. These are legal actions to which the mitigation of possible wildlife habitat losses should be connected. All privately-owned lands which are currently natural habitat which are within areas currently drainable to the river and which did not fall within our induced drainage criteria would take additional construction for drainage. Local and State permits needed for this construction should require the mitigation for habitat losses related to each specific piece of work.

After you have had a chance to review this information, Colonel Forrest T. Gay, III will contact you during the week of 22 August 1977 regarding your views and concerns of the induced drainage in connection with the Roseau River flood control project.

Sincerely,

3 Incl (trip)  
As stated

ROGER C. FAST  
Chief, Engineering Division





DEPARTMENT OF THE ARMY  
ST. PAUL DISTRICT, CORPS OF ENGINEERS  
1135 U. S. POST OFFICE & CUSTOM HOUSE  
ST. PAUL, MINNESOTA 55101

REPLY TO  
ATTENTION OF: NCSDE

7 September 1977

Mr. Jack Hemphill  
Regional Director  
US Fish and Wildlife Service  
Room 630, Fort Snelling Federal Building  
Twin Cities, Minnesota 55111

Dear Mr. Hemphill:

As a result of our joint and detailed study of potential secondary drainage associated with the Roseau River Flood Control Project, and in response to your suggestion at our meeting last week, I am including as a project feature a series of low head dams along the river to preserve the current water surface levels. This will insure that any attempts at drainage would meet with no more success than they do now. Even though the land which could potentially be converted from wetland to farmland is small, these dams would effectively preclude even that small amount from being converted. I should point out that these dams are a backup system to the ditch control structures and the channel plug at the downstream limit of the project which prevent successful secondary drainage from occurring.

In addition to the low head dams, I am including control structures on the channel cutoffs which would allow the river to follow its present meandering course in normal times and to take the shorter cutoff route in times of flood. This feature should preserve fish and wildlife values which otherwise might be lost.

The low head dams and cutoff control structures will add an estimated \$1,000,000 cost to the project. The benefit/cost ratio, even with these added costs, remains well above unity.

I would appreciate your views on the Roseau River Flood Control Project, modified as described above, so that I may convey those views to the Department of State for use in their negotiations with Canada. If possible, I would like to have your reply in hand by 26 September 1977 so that I may carry it personally to the Department representative at the meeting of the International Joint Commission in Ottawa.

Sincerely,

*Forrest T. Gay*  
FORREST T. GAY, III

Colonel, Corps of Engineers  
District Engineer

C-8





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

LWR

SEP 19 1977

Colonel Forrest T. Gay III  
District Engineer  
U.S. Army Engineer District  
St. Paul  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Dear Colonel Gay:

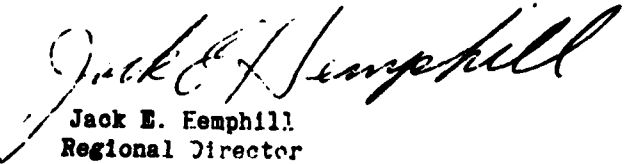
This responds to your September 7, 1977, letter regarding low head dams and other measures associated with the Roseau River Flood Control Project.

We appreciate the close coordination and cooperation you have given us in incorporating our concerns and suggestions for minimizing potential secondary drainage into the project design. As a result of our joint discussions during the past two weeks, the U.S. Fish and Wildlife Service concurs with the concept of including low head dams, side ditch control structures, and cutoff control structures as project features. We believe that implementing these measures will satisfy our major concerns with the project and provide for continuation of international negotiations.

These measures should substantially protect the area's existing fish and wildlife values over the life of the project by reducing the potential for effective drainage of wetlands in the portion of the project area in Minnesota and, to a lesser extent, in portions of southern Manitoba (Pine and Sprague Creek subwatersheds).

We look forward to working with you in establishing the location and design of the control structures and other fish and wildlife mitigating features.

Sincerely yours,

  
Jack E. Hemphill  
Regional Director



NCSFD-D

25 October 1977

Mr. William B. Nye  
Commissioner  
Department of Natural Resources  
State of Minnesota  
Centennial Office Building  
St. Paul, Minnesota 55155

Dear Mr. Nye:

This is to confirm information which I furnished to you previously regarding the feasibility of flood damage reduction through construction of a dam at Roseau Lake as an alternative to channel modification in the Roseau River downstream of the lake.

The alternative project we reviewed included channel modification from Roseau to a point approximately 8 miles downstream to reduce flooding in the city and rural area immediately downstream, and a dam at Ross to reduce flooding downstream of the Roseau Lake area. Our estimated cost for this alternative project included a payment to Canada because of altered flows at the border. The total estimated cost of this alternative project is approximately \$17.6 million. Relating average annual costs to average annual benefits for the protected reaches using the authorized interest rate of 3% resulted in a benefit/cost ratio of approximately 0.9. Besides being economically infeasible, this alternative project is opposed by local interests in the project area.

If you have any questions regarding this matter, please contact me.

Sincerely,

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer



DAEN-CWP-C

77

Mr. Thomas L. Kimball  
Executive Vice-President  
National Wildlife Federation  
1412 16th Street, N. W.  
Washington, D. C. 20005

Dear Mr. Kimball:

I am replying to your identical letters of 29 June 1977 addressed to Lieutenant General John W. Morris, Lieutenant Colonel John R. Hill, Jr., and myself regarding the Roseau River flood control project in Minnesota.

Our District Office in St. Paul made a thorough review of the U. S. Fish and Wildlife special report dated June 1977 working closely with Mr. Jack Humphill, Regional Director of the Fish and Wildlife Service (FWS). They resolved the problems on the downstream wetlands in the Roseau River Project which were discussed in the FWS report. Engineers from our staff in the St. Paul District and hydraulic engineers from the FWS and the U.S. Geological Survey have reviewed the Roseau River basin to verify the technical and legal feasibility of the drainage figure claimed in the FWS report. Further with regard to drainage, an analysis was made by the two agencies to determine what features could be included in our project to restrict the possibility of induced drainage as a result of the project.

Although the exact number of acres subject to drainage has not yet been settled, Mr. Humphill agrees that it is a much smaller figure than was included in the FWS report. However, even that reduced wetland acreage could not be drained because of alterations made in the project plan as a result of the coordinated efforts by our agencies. The elevations at all side ditch inlets will be fixed at the time of construction and no future change would be permitted without Corps of Engineers approval. Further, six to eight low dam-like structures are now planned to be installed in the bottom of the widened channel at selected locations to maintain the water surface profiles of low and normal water flows at preproject elevations.



DAEN-CWP-C

Mr. Thomas L. Kimball

77

In addition to addressing the concerns for induced drainage, the review by our District Office and the FWS Regional Office included a search for additional fish and wildlife mitigation. An opportunity was recognized to reduce the adverse effect on the fishery because of the project. To maintain the fishery in approximately 11-3/4 miles of existing channels which will be bypassed by new cutoffs, diversion structures will be constructed which will divert low and normal flows into the natural channels and permit only flood flows to pass through the cutoff. These bypassed loops were initially to be plugged at both ends for conversion to waterfowl habitat.

The Regional Office of the FWS now supports the Roseau River Project as modified and is working with our District Engineer and his staff in further coordination efforts with the Minnesota DNR and other interests in identifying additional opportunities for fishery and wildlife habitat mitigation. Our St. Paul District Engineer has discussed the project alterations with officers of the Minnesota Conservation Federation and the Minnesota Division of the Inank Walton League. He requested their contributions for further mitigation features for the project.

We are concerned about the losses associated with drainage of existing wetlands with losses to existing development because of the frequent flooding which occurs along the Roseau River. State and local officials are aware of the problems associated with the loss of wetlands, and there are existing land use and permit authorities available which can be used to control wetland drainage. In the meantime, the project could furnish reduction in flood damages for 48 private homes, 24 businesses, and a school facility in the city of Roseau as well as for 214 farms downstream.

The original environmental impact statement (EIS) for this project was placed on file with the Council on Environmental Quality (CEQ) in April 1972. Because of increasing environmental concerns, a new EIS was undertaken, and the draft was circulated for review and comment in September 1975. The environmental evaluation for the new statement was made for the St. Paul District under contract by the Institute of Ecological Studies at the University of North Dakota at Grand Forks. The latest statement contains a full discussion of resources in the area, alternatives studied, impacts of the project, comments by concerned interests, and our responses. The final EIS is being processed in this office and expected to be placed on file at CEQ in the very near future. Nonstructural measures to reduce flood damages are basically applicable to urban areas. Evacuation of the rural floodplain and prohibiting agricultural use of the area would lack economic feasibility and meet strong local opposition. The currently proposed project has strong support by residents in both the city and county of Roseau.



DAEN-CWP-C

Mr. Thomas L. Kinball

26 OCT 1977

Impacts of the project in Canada were included in studies by the International Joint Commission which has forwarded its report to the Governments of the United States and Canada. Included in the Commission report is a recommended payment for damages caused by our project that would occur in Canada. The matter is currently in negotiation between the two governments.

I delayed answering your letters until we were assured that the fish and wildlife issues had been adequately considered. We wanted to be able to bring you up to date on our efforts to accommodate their environmental concerns before providing the necessary flood protection.

Sincerely,

TILFORD C. CREEL  
Colonel, Corps of Engineers  
Assistant Director of Civil Works,  
Upper Mississippi Basin & Great Lakes

CF:  
NCD  
St. Paul Dist.



# National Wildlife Federation

16TH ST., N.W., WASHINGTON, D.C. 20036

Phone 202-797-6800

December 9, 1977

Major General Charles I. McGinnis  
Director of Civil Works  
4G066  
Department of the Army  
Washington, D.C. 20310

Dear Major General McGinnis:

I am writing to express the National Wildlife Federations's disappointment at the Corps' decision to file a final environmental impact statement on the Roseau River flood control project--in the face of the Project's substantial unresolved fish and wildlife problems, and over the objections of state and federal agencies. Frankly, we were counting on a fairer shake for fish and wildlife under your leadership.

I am aware that the St. Paul District has negotiated certain project modifications with Region 4 of the U.S. Fish and Wildlife which, it is claimed, have "resolved" the secondary drainage problem. Even so, the public has not been given the opportunity to review and comment upon an impact statement containing the proposed solution, and that in itself is a violation of NEPA and Executive Order 11514. Furthermore, the modifications proposed, which include substantial design changes in the project, must be considered a "major change in the plan of development or method of operation of the proposed action," and the failure to issue a revised draft EIS is an apparent violation of your own regulations. 33 CFR § 209.410(g)(1).

More importantly, however, there are several substantial unresolved conflicts which make any present decision regarding the merits of the project premature. Among these are the following:

1. The State of Minnesota, through the Department of Natural Resources and with the support of the Governor's Office, has expressed serious concerns over the non-urban channelization features of the project. MDNR is preparing its own EIS under state law to examine non-channelization alternatives to the rural flooding problem. Without DNR's approval--in the form of a state public waters permit--the project sponsors will not be able to proceed, and without a local sponsor, there simply is no project. In these circumstances the logical course of action for the Corps would be to await completion of the DNR EIS (due sometime in March, 1978) before publishing its own FEIS and giving the public the impression that, even from a federal standpoint, the project is ready to go forward.



## National Wildlife Federation

Major General Charles I. McGinnis

December 9, 1977

Page Two

2. The U.S. Environmental Protection Agency has also expressed "environmental reservations" about the project, and is currently conducting an independent study through its Corvallis Laboratory to determine whether the project ought to be rated "environmentally unsatisfactory" and referred to the Council on Environmental Quality under the Section 309 Procedure. Any objection by a sister federal agency with special environmental expertise should give the Corps pause in completing its own environmental review, but in the case of objections raised by the EPA--an agency with specific statutory authority to review and evaluate agency performance under NEPA--a decision to push forward without resolving these objections is not reasonable.

3. The International Joint Commission has not given its final approval to the project as required by the Boundary Waters Treaty of 1909. Negotiations are still ongoing between the Canadian Government and the U.S. State Department regarding the amount of monetary damages to be paid to the Province of Manitoba for flood damage the project will cause there. Until a final figure is agreed upon, the final cost-benefit analysis for the project cannot be arrived at; and again no final decision to construct should be made.

4. The U.S. Fish and Wildlife Service, even though it has apparently bought the solution to the secondary drainage problem, has yet to recommend--and the Corps approve--a final fish and wildlife mitigation plan under the Coordination Act. This obligation, of course, runs to both the Service and the Corps; and to be fully complied with, requires joint cooperation by both agencies. But the final impact statement fails to contain even a proposed mitigation plan and that, as you know, violates both NEPA and the Coordination Act.

5. Finally, there are the objections of a score of national and local conservation organizations, including NWF, as well as a number of local landowners residing in Roseau County. Speaking for NWF, we are still not satisfied that the solution to a rural flood problem is the channelization of 43 miles of one of the richest fish and wildlife resources in the Northern Prairie Region of this country. Nor is NWF satisfied, as the FWS appears to be, with a "trade-off" which sacrifices the State of Minnesota's finest warm water stream fishery (by MDNR's reckoning, and they are the experts) to prevent the drainage of, by everyone's estimate, tens of thousands of prime waterfowl habitat. It seems to us, and a good many others, that the Corps should come up with a solution to this common agricultural problem (i.e., periodic flooding of cultivated wetlands) that does not exact such a heavy price in terms of fish and wildlife resources. That is certainly the principal objective of MDNR, which is earnestly attempting--with little assistance to date from the Corps--to come up with a solution that does not require ditching the Roseau River. Instead of pitching in with its considerable expertise and available resources, however, the Corps has chosen to play the role of devil's advocate against MDNR's proposed alternatives.



## National Wildlife Federation

Brigadier General Charles I. McGinnis

October 9, 1977

Three

To sum up, the National Wildlife Federation believes the Bureau project is a long way from a legitimate final decision. All the sequence of the final EIS has only served to confuse the issues and intensify the conflict. Accordingly, NWF makes the following recommendations:

- (1) The Final EIS be withdrawn from CEQ pending a resolution of the five outstanding objections set forth in this letter.
- (2) A public notice of the withdrawal be printed in the Federal Register and state and local newspapers in the project area.
- (3) The Corps undertake a serious effort, in conjunction with the U.S. EPA, U.S. FWS, and the IJC to develop a non-structural solution to the rural flood problem. Structural alternatives such as those presently being studied by MDNR (e.g., small headwater impoundments) and non-structural alternatives (e.g., crop insurance, floodway easements), deserve particular attention.
- (4) After resolution of the foregoing issues, and MDNR's completion of its Final EIS, the Corps should issue a revised draft impact statement.
- (5) A public meeting should then be scheduled to discuss the draft EIS and the proposed solution to both fish and wildlife impacts associated with the project as re-designed (which may, and hopefully will, be a significantly different project).

NWF stands ready to aid in this effort in whatever way we can. I trust these criticisms are taken in the spirit in which they are given, namely as a means of obtaining an administrative resolution of the problems--legal and environmental--described above.

Sincerely,



Patrick A. Parenteau  
Counsel

cc: Mr. Jack Ford  
Deputy Asst. Sec. of the Army,  
Civil Works

Brigadier General Drake Wilson  
Deputy Director of Civil Works

Lt. Colonel John Hill  
Asst. Dir., Env. Programs



## National Wildlife Federation

Major General Charles I. McGinnis  
December 9, 1977  
Page Four

cc: (continued)

Brig. Gen. Robert L. Moore  
Div. Eng., North Central Div.

Col. Forest T. Gay III  
Dist. Eng.,

Mr. Jack Hemphill  
Reg. Dir., FWS

Mr. George R. Alexander, Jr.  
Reg. Admin., EPA

Mr. Richard D. Vine  
Dep. Asst. Sec. for Canadian Affairs  
State Department

Mr. Romeo LeBlanc  
Minister, Fisheries & Env.  
Canada

Mr. William Nye  
Commissioner, MN DNR





UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION V

230 SOUTH DEARBORN ST  
CHICAGO, ILLINOIS 60604

DEC 12 1977

Colonel Forrest T. Gay, III  
District Engineer  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

RE: 75-084-194  
F-COE-F36028MN

Dear Colonel Gay:

We have completed our review of the Final Environmental Impact Statement (EIS) for the Roseau River Flood Control Project, Roseau and Kittson Counties, Minnesota. Your letter of November 10, 1977, requested our review of this Final EIS to determine whether or not our comments on the Draft EIS of November 10, 1975, had been adequately addressed. Our comments on the Draft EIS expressed our concerns about the wetland impacts, water quality impacts, and short-term and long-term impacts upon the river's ecosystem.

Since the Final EIS was written, your agency has made major changes in the project design. The changes involve the addition of seven lowhead dams. These lowhead dams could significantly change the impacts of the project. They may adversely affect the water quality of the Roseau River, especially since agricultural practices within the watershed may increase. Furthermore, the depth of the water will be shallow, and there will be a large surface area and no shoreline vegetation. This situation has the potential to cause adverse water quality impacts.

The Final EIS said on page 61 that the enrichment, along with increased light and temperature due to removal of riparian vegetation, would encourage the development of aquatic macrophytes and algae especially in areas of low water velocity. The lowhead dams will create the exact situation described above which could have serious water quality impacts. The Final EIS further stated that large standing crops of aquatic plants could exert added demands on the dissolved oxygen during the night as a result of their respiration. At this time, we still have reservations in regard to the future water quality of the Roseau River.

It is our understanding the lowhead dams are to prevent the drainage of adjacent wetlands. It is difficult for us to assess this benefit without having all available hydrological data.

Therefore, until all additional information is provided to fully assess the impacts upon the environment, we will refrain from making any comments. Our concerns expressed on the Draft EIS remain and must be addressed when your agency prepares a revision of the EIS.



DEC 12 1977

-2-

If you or your staff have any questions in regard to our comments, please contact Mr. William D. Franz at 312/353-2307.

Sincerely,

  
George R. Alexander, Jr.  
Regional Administrator



DAEN-CWP-C

Mr. Patrick A. Parenteau  
Counsel, National Wildlife Federation  
1412 16th Street, N. W.  
Washington, D. C. 20036

Dear Mr. Parenteau:

I am replying to your letter of 9 December 1977 addressed to Major General Charles I. McGinnis regarding the Roseau River flood control project.

On 25 October 1977, I responded to a letter from Mr. Thomas Kimball, Executive Vice President of your organization. In that response, I described our activities in preparation of the latest Environmental Impact Statement for the Roseau River flood control project. The Statement in draft form was circulated for review and comment in September 1975 and was concurred in by the State of Minnesota. The final Statement contains a full discussion of resources in the area, alternatives studied, impacts of the project, comments by concerned interests, and our responses to comments. Our Statement contained discussion of all alternatives for the project. The final Statement was placed on file with the Council on Environmental Quality (CEQ) in November 1977 following resolution of the concerns raised by the U.S. Fish and Wildlife Service (FWS) and the inability of the State of Minnesota Department of Natural Resources (DNR) to identify feasible new alternatives that had not been previously studied. Also included in our response to Mr. Kimball was a report on the status of negotiation with Canada relating to the project. In November 1976, the International Joint Commission forwarded its report to the governments of the United States and Canada with a recommended United States payment for damages caused by the project in Canada. Preliminary negotiations between the governments of the two countries have begun on this matter.

During our coordination to resolve the concerns of the FWS, a number of features were identified to increase the mitigation for fishery and wildlife habitat losses due to construction of the project.



DAEN-CWP-C

Mr. Patrick A. Parenteau

We consider that the additional features now proposed do not constitute a major change in the plan for the project. As we stated in our transmittal of the final EIS to CEQ, once these features are designed and coordinated, an EIS supplement will be prepared and placed on file prior to construction of the project.

Until September 1977, the State of Minnesota supported the channel modification project with concerns relating only to mitigation of fishery and wildlife habitat losses. In April 1977, the Minnesota DNR was designated the responsible agency for preparation of a State EIS by the Minnesota Environmental Quality Council. The Council recognized work already completed on environmental matters by the Corps of Engineers and called for the Federal final EIS to be accepted as the State draft EIS. The Council staff members stated that attempts would be made to expedite processing and completion of the State EIS. Under the normal schedule prescribed by the Council, without expediting, the final State EIS was to be completed during December 1977. In September 1977, the new Commissioner of Natural Resources, William B. Nye requested review of the Roseau Lake flood storage impoundment along with a shortened channel modification project to reduce flood damages in the city of Roseau. Our St. Paul District Engineer told him this alternative had already been studied and was not economically feasible. The District Engineer's earlier studies were reviewed and he confirmed the findings. At the time you wrote, Commissioner Nye was trying to get Congressional support for study of another alternative which includes tributary impoundments below Roseau and the shortened channel project for relief in the city. This alternative does not provide the degree of protection furnished by our proposed plan, is not economically feasible, does not have a local sponsor, and from information available has no support in the Minnesota Congressional delegation for its study. Commissioner Nye has stated that if he cannot obtain the necessary support from the Congressional delegation, he will support the presently designed Corps project. On 24 January, Commissioner Nye informed our St. Paul District Engineer that he and his staff would support our project. Our District Engineer also requested the Commissioner and his staff to participate in the design and coordination for the additional fish and wildlife mitigation features now proposed and he agreed to work with us on this matter. Further, we have requested a review of the project with both the DNR and the FWS in an attempt to identify any other needed mitigation measures. Our work with DNR and FWS will be coordinated with the Environmental Protection Agency (EPA) because of its interest in the project.



LA-N-CW-0

Our St. Paul District Engineer received a 6 February 1978 letter of notification from Rudy Perpich, Governor of Minnesota, that he supports the Roseau River Flood Control project as proposed by the Corps of Engineers. Also from our studies there are no feasible alternatives to our proposed plan that provide the flood damage reduction authorized for the Roseau River. Discussion of the added mitigation features can be readily provided in a supplement to our EIS that was filed in November 1977. Thus, we see no reason why the Statement on file should be withdrawn.

Thank you for your interest in our project. A copy of the draft supplement to the EIS will be furnished to you as well as the filed final issue upon their completion and filing with EPA.

Sincerely,

TILFORD C. CREEL  
Colonel, Corps of Engineers  
Assistant Director of Civil Works,  
Upper Mississippi Basin & Great Lakes

CF:  
NCD  
St. Paul Dist



NCS-ED-D

2 November 1978

Mr. David F. Zentner  
Immediate Past National President  
Izaak Walton League of America  
824 1st National Bank Building  
Duluth, Minnesota 55802

Dear Dave:

Thanks for your letter of 6 September 1978 on the Roseau River Flood Control project and the queries on behalf of the Izaak Walton League. It has taken some time to put this response together as we have discussed it not only in-house but also with the managers of the Roseau River Watershed District. A number of the managers thought that a meeting with you would be useful, and they will probably be contacting you in the near future if they haven't already. Now, let me respond to your letter paragraph by paragraph. I have marked a copy of your letter for reference.

Starting with your paragraph A, thank you for your kind words on the cooperation between the Corps and the Iwas. We want to work with any agency, public or private, which has major concerns about this project. However, let me clarify the reason for the modifications made to the project. The U.S. Fish and Wildlife Service (USFWS) had reservations about the efficacy of the side ditch control structures in preventing additional wetland drainage, a concern which the Corps does not share, and requested that additional control structures be placed in the stream proper. We agreed to do this, treating these structures as backup to the controls on the side ditch inlets. Furthermore, we added, voluntarily, the structures in the several channel cutoffs. These latter features will preserve the meandering flow of the river in normal times and, in flood, allow the passage of those waters by the more direct route. I feel that preservation of the meandering nature of the stream will benefit the fishery and prevent stagnation in the oxbows. As a result of the project modifications, the USFWS



NCSFD-D

2 November 1978

Mr. David F. Zentner

is now a strong supporter of the project. A copy of Jack Hemphill's letter of support, dated 19 September 1977, is inclosed. You may recall, Dave, that the day after this letter was signed I telephoned you describing the modifications and you termed them "terrific".

Your paragraph 3 suggests that the modifications to the project will cause the flood waters to run off more rapidly from a portion of the watershed. That is not totally correct. The project, modified or unmodified, will provide for the rapid runoff and the resultant flood control through an increased channel capacity. The modifications to the project will preclude "secondary agricultural drainage", or any other kind of drainage, which cannot be accomplished now. Note that carefully, for if land can be drained now it can also be drained after the project is completed.

Your paragraph 1 describes the Roseau River as a natural meandering stream. That is a misnomer. The river was dredged in the early part of this century, and the spoil banks from that effort have significantly altered the river's character. Part of the flood damages can be attributed to that dredging and the resultant constriction in channel capacity. The project will correct those errors and increase the carrying capacity of the channel. The modifications to the project will, in Jack Hemphill's words, "substantially protect the area's fish and wildlife values over the life of the project". The effectiveness of the project and its beneficiaries are described in the FIS currently on file with EPA. Two specific examples are paragraph 1.800 which presents a tabulation of average annual benefits due to reduction in flood losses and paragraphs 4.311 and 4.312 which present the degree of protection and reduction in flood stages afforded by the project. Our economic methodology for determining reduction of flood losses and thus the benefits due to the proposed project includes finding the flooded area outline associated with floods of various frequencies and the uses of the inundated area. Economic benefits are then established through evaluation of the reduction in flood damages due to the project.

Your paragraph 2 asks who will benefit. The names of landowners are not necessary for our procedures. However, the Watershed District, the local project sponsor, must determine benefited and damaged property owners so it can assess for benefits to pay for costs due to construction of the project. The Watershed District has identified 48 private homes, 24 businesses, and a school facility in Roseau; and 214 farms downstream that will be benefited by the project. The names of owners of these properties are available from the managers of the Watershed District.



NCS-ED-D  
Mr. David F. Zentner

2 November 1978

Your paragraph 3 is answered in the earlier portion of this letter: No wetland acres, now in danger of secondary drainage, are preserved by the modified project. If the land can be drained now, it can be drained after the project is completed. If it can't be drained now, it can't be drained after the project is completed. What can be prevented is the drainage of lands that could be connected to the river were it not for the fixing of the elevation of the ditches leading into the river. The in-stream modifications give the added assurance that, if somehow those ditch structures were breached or bypassed (and such action would be forbidden by the terms of the local cooperation agreement and would be corrected immediately), the drainage attempts would be unsuccessful because the stream's surface would remain at the same elevation. The forthcoming supplement to our EIS will provide a description of measures included in the project to prevent additional drainage once construction is completed. This discussion will include results of the continuing coordination concerning the low profile control structures requested by the U.S. Fish and Wildlife Service for drainage control. Also, we will include results of the drainage study currently underway by the U.S. Geological Survey.

Your paragraph 4 questions structure lifetime. For purposes of economic analysis, the structures are given a 50-year lifetime; for example, they are amortized over a 50-year period. However, the structures are designed to last indefinitely given proper maintenance.

The impoundment alternative proposed by Mr. Nye, paragraph 5, has questionable feasibility. However, the supplement to the EIS will discuss it and other alternatives to the project in considerable detail to include economic, social, and environmental impacts.

The USFWS, paragraph 6, has stated their support for the modified project. Mr. Hemphill has told me and others, including the DNR, that the DNR impoundment proposal would, by virtue of the fluctuation in reservoir levels, have an adverse impact on fish and wildlife.

In paragraph 7, you ask the extent the project will serve to cause agricultural encroachment into the 50-year floodplain. Essentially, all privately-owned land along the river which floods as infrequently as once in 50-years is currently in agricultural use. This is considered prime agricultural land in Roseau County. Farmers in the area find that it is profitable to farm in some areas even if they lose a crop to flooding once in every 3 or 4 years. Thus, they are already in the 3- to 4-year floodplain. Our supplement to the EIS will contain an expanded discussion of the no-project



2 November 1978

Mr. David F. Zentner

alternative. Without the project, and with technological advances and commodity price increases which are sure to occur in future, private resources will be expended to continue agricultural development in the area. Only State and local land-use controls can prevent conversion of existing publicly-owned natural and wetland areas from conversion to private agricultural use. Incidentally, our project benefits include only those for flood damage reduction on existing privately-owned land.

Your paragraph C worries me because it seems to reflect neither local sentiment nor local knowledge about the project. At the public meeting in Roseau called by Mr. Nye on 12 December 1977, there were a few persons who spoke against the project. However, the overwhelming majority of the large audience supported the project as modified. Every single public official who spoke told the DNR that they didn't want any part of their impoundment alternative and that the modified project should be built without delay. Even State Representative Art Braun, who harbored personal reservations about channelization, said that he supported the project since it was obviously the will of his constituents. At that meeting, I described the anti-drainage features as I had earlier described them to managers of the Watershed District. The modified project, nevertheless, still has their support. We have no reservations that the project will function hydraulically as designed.

Your proposal in paragraph D, to create a trust fund to compensate flood losses, is not viable. There is no such authority in Federal law. There is a flood insurance program, and it is discussed in the EIS. Flood insurance, though, does not prevent damages but instead distributes the costs of those damages throughout the nation. The trust fund might compensate the homeowner or the farmer, but it would not relieve the anguish and distress of those who are flooded and forced from their homes and property. It would not replace a life at any cost if any were lost. It would not make up for the revenue losses to the shippers of the farm products or others involved in supporting the farmer. It would not make up for the loss of gold flow resulting from normal grain export. The project, on the other hand, would meet all of those needs by preventing the damages from happening.

I agree with you, Dave, that there is much frustration over this project. Perhaps the most frustrated of all are the people of Roseau and Kittson Counties who have been trying for 50 years to provide some form of flood



NCSFD-D

2 November 1978

Mr. David F. Zentner

protection from the Roseau River. I am hopeful that, through informing all who are concerned about all aspects of this project, the air can be cleared and that the people of those counties can realize their long-cherished dream.

Thank you for your continuing interest in this project.

✓ Sincerely,

✓  
2 Incl

as

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer



1574-02-11-11.5-78

THE IZAAK WALTON LEAGUE OF AME

September 6, 1978

Colonel Ted Gay  
District Engineer  
Department of Army  
St. Paul District, Corp of Engineers  
1135 U.S. Post Office - Custom House  
St. Paul, MN 55101

Re: Roseau River Flood Control

Dear Ted:

Last Monday (8-28-78) Jim Ross of the Wildlife Federation, myself, Dr. Paul Toren, and Larry Schultz sat down with Commissioner Alexander, Vonnice Hagen and had a "re-discussion" of the Roseau Plan.

I thought as a result of that meeting it only fair to bring you up to date on where I think the Ike's stand and hopefully what we need to know to finally get the kind of handle that we need to have organizationally before concluding to agree with you that the "Modified Project" is supportable or to disagree.

Let me indicate first of all, that we in the League greatly appreciate the cooperation of you and your "Agency" to date. We appreciate the fact that the project was modified due to protest by the Fish and Wildlife Service, National Wildlife Federation, and others.

We understand from the layman's standpoint that basically the position you've held is that by modifying the project you can accomplish a more rapid run off from a portion of the watershed and thereby reduce flooding in the Community, and to certain downstream landowners. We understand that it's your intention to propose that the "instream modifications" will maintain water levels at a point so as to preclude "secondary agricultural drainage". In evaluating the project and attempting to determine the agreement with or disagreement with these contentions, the following include the questions still not satisfactorily answered:

1. We can find nothing, in project description, or in letter exchanges, that really show how effective the project will be for either the city or the downstream rural landowner. While it's true that we are not the proposed beneficiaries of the flood relief, it's also true that however the project is modified it will disrupt further a natural meandering stream, injure fish and other types of wild-life, and still possibly provide for drainage. Therefore, if it can't be shown that the project after spending 20 to 24 million



dollars isn't going to really mitigate the flooding, then the beneficiaries will gain nothing, and society at large and the United States taxpayer have lost. There are those who question the hydraulic effectiveness of the project total, and also the hydraulic effectiveness of the modifications as regards their ability to be preventers of secondary drainage. Therefore, we agree with you, in your request, that the "U.S. Geological Survey" is an excellent prospect for an independent evaluation of those issues.

2. Who is going to benefit? Looks to us as though there's going to be very few direct beneficiaries of either the project as proposed, or even the modified project, we've yet to see a list of the names of the downstream property owners and who they represent. This should be a matter of public information and yet I cannot find it in the DEIS or elsewhere.
3. Exactly which acres of wetland are the ones now in danger of secondary drainage that would be preserved based on your view of the "Modified Project"? It seems to me that there ought to be a map, including legal descriptions of said acres, for review and concurrence or disagreements by both the Federal Agency (Fish and Wildlife Service) and the Minnesota DNR.
4. What is the lifetime of the structures? In attempting to analyze the safeguards against draining provided by structural modification of the project versus state and federal policy and philosophy towards drainage in this area one must have an idea of the long-term efficacy and integrity of the modified structures. At this time we have none, perhaps this again, is an area of attention that the U.S.G.S. could be directed to answer.
5. Is the alternative suggested by MDNR (i.e. upstream impoundments on Sprague Creek and Pine Creek and restoration of Roseau Lake) hydrologically feasible as a flood control alternative to the Proposed Modified Project.
6. We agree with the National Wildlife Federation that the Fish and Wildlife Service ought to comment regards their environmental preference from all of the alternatives presently available including the above referred to "DNR Alternative".
7. Finally, to what extent will the project serve as a catalyst for further agricultural encroachment into the 50 year flood plain, and what impact does that have on the Project Cost - Benefit?

It seems to us, Ted, that the mentality of many involved with the Project is one of frustration regards further consideration because this one has been with us so long. Yet there are many unresolved questions.



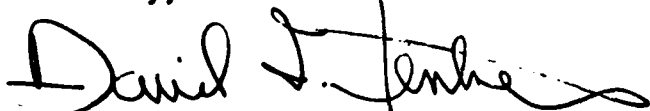
Even in the Roséau area, there's less than unanimous approval and by that I don't mean one or two opposers, but I mean a substantial number of opposers, and great confusion over what the project will really do. Most of the supporters of the project think it is going to solve their flooding problems, and along with it permit them to accomplish the secondary drainage, in fact I understand that privately many of them will indicate that that's the notion they have whether or not the Corp will tell them that's not the case. They intend to, through private mechanisms, accomplish the drainage by themselves. I think that there's considerable concern as to whether the project from strictly a flood control standpoint will do what's proposed.

You'll recall at one time that I suggested that we take the \$20,000,000, and put it in a trust fund and appropriate for flood control losses (only when proved that such losses occurred) and that such a scheme would be sensible since no alterations of the natural environment would be required and yet what agriculture had been permitted to date to develop would be protected. That causes some people to be amused because that's too straight forward. But on the other hand, it may make more sense than justifying a project at this time which so few seem to understand regards it's benefits and which has so many unanswered questions regards its hazards.

Surely by record of performance for many, many years, no organizations have shown more concern for maintaining wetlands than the National Wildlife Federation and the Izaak Walton League of America, Inc. But, we cannot in good conscience neglect the other issues especially when we're not assured of the veracity of the mechanism at hand, regard the long-term integrity of the existing wetlands, nor can we ignore the injury to the warm water fishery through the main stem alteration.

I'd be appreciative to your response in regard to specific questions in this letter. I imagine we could discuss some of this shortly as I'll be seeing you in a few days at your meeting in Brainerd.

Sincerely,



David F. Zentner  
Immediate Past National President  
Izaak Walton League of America, Inc.





## United States Department of the Interior

GEOLOGICAL SURVEY  
702 Post Office Building  
St. Paul, Minnesota 55101  
November 7, 1978

Mr. Charles A. Hughlett  
Acting Regional Director  
U.S. Fish and Wildlife Service  
Federal Building-Fort Snelling  
Twin Cities, Minnesota 55111

Dear Mr. Hughlett:

In accordance with a telephone conversation with Deputy Assistant Secretary Myshak's office and Mr. F.T. Schaefer of our Regional office, we are transmitting to you our comments on the revised Roseau River Flood Control Project. The comments were requested by Col. F.T. Gay III, District Engineer, St. Paul District, Corps of Engineers, in a letter to Assistant Secretary Herbst dated June 30, 1978. Please forward the comments to the Corps of Engineers as soon as possible.

Sincerely Yours,

Donald R. Albin  
District Chief

cc: ✓ Col. F.T. Gay III, COE, St. Paul  
Chief Hyd, WRD, Reston  
R.J. Myshak, DI, Wash. DC  
Reg. Hyd, WRD, NR, Reston



## ROSEAU RIVER FLOOD CONTROL PROJECT

The attached remarks were developed in response to the letter of June 30, 1978, from Colonel Forrest T. Gay III, St. Paul District, Corps of Engineers, to Robert L. Herbst, Assistant Secretary for Fish and Wildlife and Parks requesting USGS opinion on the usefulness of proposed side-ditch inlet and in-channel-control structures in preventing drainage; and the memorandum of August 8, 1978, from Richard J. Myshak, Deputy Assistant Secretary for Fish and Wildlife and Parks, to Joseph S. Cragwall Jr., Chief Hydrologist, WRD-USGS, confirming the arrangement for a hydrologist to review specific supplemental design features not included in the project described in the Environmental Impact Statement of July 1976.

Supplemental data, reports, and correspondence relating to the project received by the Minnesota District, WRD-USGS include the following items:

1. Copy of letters from Col. Gay to Ronald L. Mustard, Director, Office of Federal Activities, U.S. Environmental Protection Agency, Chicago, dated 27 April 1978, and 3 May 1978, with enclosures.
2. U.S. Fish and Wildlife Service Special Report "Roseau River Flood Control Project, Roseau County Minnesota" June 1977.
3. Copy of letter from Col. Gay to Robert L. Herbst of 30 June 1978, with enclosures.
4. Copy of letter from Patrick A. Parenteau, Counsel for the National Wildlife Federation, to Robert L. Herbst, dated July 6, 1978, with enclosures.
5. A collection of miscellaneous design memos, computations for low-head dams, and flow-duration-data plots for the Roseau River. Much of this duplicates enclosures of item 1 above.

Supplemental design details and hydrologic and hydraulic information contained in items 1, 3, and 5 of the above constitute the information on which this review is based. Details of the report of item 2 are not applicable to the project supplements, which were developed since the report was written.

General features of supplements that have significant impact on the hydraulics of the project and involve changes from plans described in the EIS of July 1976 include the following:

- a. Relocate low-head dam 3 and add two dams between No. 1 and No. 3; delete dam 4, providing a total of 9 dams. Dams have a horizontal crest without a notch. Previous design included a notch in the crests.



- b. Addition of control structures in the new channels to direct low flows through the old natural channel to maintain the existing meandering course. Design of these structures was not complete as of October 5, 1978. (Previously the old meander channels were to be blocked at the new cutoffs). These structures are expected to have little impact on the profile for 500 ft<sup>3</sup>/s or less flow with the in-channel low-head dams of item a in place.
- c. Addition of control structures on the outlet of ditches entering the river in the project area to restrict flow to that occurring for pre-project conditions. The proposed structures are listed on plate 30 of the General Design Memorandum and the structures listed are subject to revisions and additions of an accompanying table. Data on these structures are given in the enclosures accompanying item 1 of the supplemental data.

SUMMARY STATEMENT--Except for a very small area near the upstream end of the project at Roseau, the proposed low-head in-channel dams and side-ditch inlet-control structures, as designed, will effectively prevent drainage of wetlands in the Roseau River basin.



1. Impacts of low-head in-channel dams.

The proposed dams were designed to maintain the water profile for 500 ft<sup>3</sup>/s flow at approximately the same average elevation as for the present channel and should function in that manner. Flow-duration data for the gaging station at Ross indicate that flows of 500 ft<sup>3</sup>/s or more occur only 16 percent of the time. For flows less than 500 ft<sup>3</sup>/s, occurring 84 percent of the time, the dams will maintain the profile as a series of pools at an average water level higher than exists for present conditions. This effectively reduces the available gradient toward the river in side ditches entering the Roseau River. Therefore, the dams are significantly effective in reducing the potential for side drainage. The reduction in potential for drainage is indicated by the increase in low-water profile elevation in the river and can be evaluated with some certainty only at gage locations. From data for the gage at Ross, for example, the flow-duration curve indicates flow will be 40 ft<sup>3</sup>/s or less 50 percent of the time. The profile is to be maintained by dam 6 downstream with crest elevation at 1,023.65 feet. That elevation is 3.5 feet higher than the present stage for 40 ft<sup>3</sup>/s flow at that point. The average rise in profile elevation for 40 ft<sup>3</sup>/s flow appears to be on the order of 2 feet but there is no way to accurately evaluate this over the total project.

2. Impact of control structures on side-ditch inlets to the river.

Structures to be constructed on drainage ditches entering Roseau River are sized to restrict flow to the present capacity of the ditches, and are designed with culvert inverts or other control feature at the level of the existing ditch bottom adjacent to the river. Thus, they are designed to limit side drainage to that existing at the start of project construction.

Review of the design data for the individual structures indicates that they will function in the manner intended to reduce the potential for side drainage to generally the existing extent of drainage. Minor exceptions to this are noted for the 4 structures on ditch outlets nearest Roseau where the low-water profile may be lowered by the project. Here the tailwater on the ditch structures will be lowered allowing some increase in flow rate from those 4 ditches. The size of the outlets of these 4 structures limits their capacity, therefore, this is seen as a negligible effect.

The rationale and basis for these opinions follows.



### Low-head in-channel dams

Review of data presented with item 1 shows that side drainage will be improved at a flow of  $500 \text{ ft}^3/\text{s}$  in short reaches immediately downstream from each low-head dam. The increased fall over present conditions is a maximum of 1.5 feet, which occurs at the downstream side of structure No. 5. The area affected by this condition is small and, more importantly, the time when this condition will exist is short. Therefore, the increased fall is a minor exception to the general impact of the low-head dams and can be ignored. Lowering of the  $500 \text{ ft}^3/\text{s}$  profile downstream from the dams is offset by raising the profile upstream by a nearly like amount compared to present conditions. For reviewing the total impact of the dams on drainage however, the flow of  $500 \text{ ft}^3/\text{s}$  should be put in perspective with the total regime of flow on the Roseau River.

Continuous flow records are available for the gaging station 05107500, Roseau River at Ross since August 1928. The station is located at the highway bridge 0.2 mile north of Ross near river mile 123, about 7.5 miles upstream from the middle of the 43.9-mile project. Log Pearson Type III computations on annual peak flows for that location indicate a 93 percent chance that a flow of  $500 \text{ ft}^3/\text{s}$  will be equalled or exceeded at least once in any year. However, the summary of duration tables of daily discharge for the years 1929-75 indicates that for only about 16 percent of the time does the flow exceed  $500 \text{ ft}^3/\text{s}$ . Also, 50 percent of the time flow in the Roseau River at Ross is  $40 \text{ ft}^3/\text{s}$  or less. For 84 percent of the time, flow in the improved channel with the low-head dams will be a series of pools at elevations within a foot or so above the dam crests; and, because of the long crest lengths for flow to occur over the dams, the pools will be at an elevation within 0.1 to 0.3 foot above the crests more than half the time. The dams will maintain the water level at low flow from one to four feet higher than for present conditions. For example, at the Ross gage the profile elevation for  $40 \text{ ft}^3/\text{s}$  is 1,020.2 feet for present conditions. The crest of the nearest dam downstream is to be at elevation 1,023.65 ft, which will maintain a pool at a level about 3.6 feet higher than for present conditions. The low-water profile with proposed low-head dams in place will be at a higher elevation than for present conditions, which definitely will restrict drainage from adjacent areas along that reach. Side drainage will be restricted even more than for present conditions because of the generally decreased gradient in side ditches at river flows less than  $500 \text{ ft}^3/\text{s}$ , which will occur 84 percent of the time.



### Side-ditch-control structures

Generally, where the outlet-control structure in the ditch consists of a culvert, the size of the culvert and friction loss through its length limit flow for a particular fall from headwater in the ditch to tailwater in the river. Where the bottom of the side ditch is near the bed of the river, the addition of dams in the river maintains tailwater on these structures limiting available gradient toward the river to slopes less than for present conditions, thereby reducing rate of drainage and the potential for additional drainage. Where the structure and ditch bottom enter at elevations above the low-water pools, the size, friction loss, and structure geometry limit flow from the ditches to the structure capacity. Structures were sized to match existing constraints in the side ditches; therefore, drainage and drainage potential are limited by the structure to approximately the existing drainage. Review of design data presented on plate 30, with the assumption that the low-head dams would be installed to maintain the low-flow profile elevations, results in the structures falling into one of 4 categories with respect to their function. The categories and function are described below.

<u>Category</u>	<u>Effect on Drainage--Function</u>
1	Drainage potential is considerably reduced by a fixed invert elevation higher than the present low-water profile elevation in the river. Future drainage should remain about as at present, controlled by opening size in the structure.
2	Drainage and drainage potential are reduced because the low-water profile maintained by dams in the river is higher than the present low-water profile. The invert elevation or size of opening provided in the structure may reduce the potential for drainage or keep it as presently exists, but this is at least partly masked by the higher water level maintained in the river.
3	The structure is expected to have little or no effect on drainage or drainage potential.
4	Some increase in potential for drainage may be created because the low-water profile in the river is lower than presently exists and getaway conditions are improved increasing the possible flow rate at the structure. This occurs only very near Roseau where the low-water profile for the improved channel will be lower than presently exists in upstream end of the pool at dam 8.



For the 70 structures (other than plugs) listed on Plate 30 the following following breakdown by categories was found:

<u>Category</u>	<u>No. structures</u>
1	39
2	25
3	2
4	4

The two structures in category 3 are downstream from the channel improvement and the structures proposed involve little or no change from that existing. Modifications to the 4 structures in category 4 involve retaining part of the existing structure in an area where the channel is to be deepened, and the low-water profile is expected to be lowered, removing effects of tailwater on flow. This is expected to result in a small, probably negligible increase in drainage and drainage potential because the original size structures will remain.

George H. Carlson



2 January 1971

Mr. Joseph M. Alexander  
Acting Commissioner  
Department of Natural Resources  
Centennial Office Building  
St. Paul, Minnesota 55155

Dear Mr. Alexander:

We are currently preparing a supplement for the final Environmental Impact Statement for the Roseau River flood control project. Proposed project design changes would alter conditions at cutoffs constructed as part of this project and by the channelization which occurred between 1906 and 1920. Your recommendation for treatment of the cutoffs in light of the new designs would help insure that fish and wildlife objectives would be met within the constraints of the overall project design.

As a result of coordination with your department, the initial plans included in the design memorandum we completed in 1971 called for plugs to be installed at each end of the natural channel loops to be bypassed by both previous and currently proposed cutoffs. The lowered water surface profile and reduced duration of high water resulting from the proposed channelization would impair fish access for spawning in the natural loops bypassed by the cutoffs. The value of these natural loops as waterfowl nesting habitat was to be improved by constructing plugs in the natural channels at each end of all cutoffs with a flap-rated culvert in the upstream plug to provide for water in the loop.

Low flow profile control structures have been added to the proposed features in the project at the request of the U.S. Fish and Wildlife Service. This will result in a greater depth of water at low flows following project construction than provided in our initial design. Thus the cutoffs and natural channel loops would have a greater depth of water than during earlier considerations. As a result, the placement of the plugs is being reevaluated and coordinated with your department and the Fish and Wildlife Service.



RCSEB-D

2 January 1979

Mr. Joseph W. Alexander

In the recent review and coordination it has been determined that all downstream plugs should be removed to allow fish access as well as waterfowl use. Further, upstream plugs should be removed at new cutoffs. Structures would be placed in the new cutoff channels to divert most of the low and normal flows into the natural channels.

Concerns have been raised regarding the possibility of construction induced sedimentation in the natural channels at the old cutoffs. Alternatives discussed to reduce sedimentation have included solid plugs, plugs with flap-gated culverts and temporary cofferdams installed at the upstream end of natural channel loops at these cutoffs. This matter needs to be resolved before we can proceed with project design.

We request your comments regarding elimination of the plugs and installation of diversion structures at the new cutoffs. We further request your recommendation regarding elimination of plugs at the old cutoffs. An early response to these requests would assist us in meeting our schedule for the preparation of the supplement to the Environmental Impact Statement.

Sincerely,

WALTER L. HENNE  
Lieutenant Colonel, CE  
Acting District Engineer

CF:

Mr. Oliver Jarvenpa  
Chief, Ecological Services Section  
Division of Fish and Wildlife  
Minnesota Department of Natural Resources  
390 Centennial Building  
St. Paul, Minnesota 55155

ED-ER, Robin Blackman





STATE OF  
**MINNESOTA**  
DEPARTMENT OF NATURAL RESOURCES

File No. \_\_\_\_\_

February 13, 1979

Forrest T. Gay, III  
Colonel, Corps of Engineers  
Department of the Army  
St. Paul District  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

Dear Colonel Gay:

This is in response to your letter of January 23, 1979 concerning the U.S. Geological Survey (USGS) assessment of the proposed low profile control structures in the Roseau River flood control project.

I concur with the USGS summary which indicates that the proposed low profile control structures together with side-ditch inlet controls, as currently designed, will not provide improved outlet conditions for wetland drainage along most of the project reach in the Roseau River watershed.

While the addition of the low profile control structures to the project in the interest of insuring future preservation of wetlands is a worthwhile goal, we are concerned that they will increase adverse project impacts on the Roseau River fishery in Minnesota and prevent the river from recovery of any of its fisheries values after initial project construction. The problem is further compounded by the fact that the incremental destruction of fisheries resources due to the addition of the low-head dams is balanced only by some unquantified additional protection primarily to type 2 and 6 wetlands. It appears to me, that a combination of fixing the side ditch inlets plus regulatory control by the project sponsors under USCE supervision would provide protection to wetlands in the absence of low-head dams.

Accordingly, it is difficult for me to categorically approve of the low-head dams as presently envisioned. We would prefer to have them deleted from the project wholly or in part (see item #2 of Roger Holmes' letter to Roger Fast dated February 1, 1979). If deletion of at least the three most downstream dams cannot be agreed upon among the affected agencies in a timely fashion, then I would recommend exploration of structural design modifications that would at least to some extent mitigate adverse impacts to the Roseau River fishery.



Colonel Forrest T. Gay, III  
February 13, 1979  
Page Two

Once the structure location/design issue is settled, I would be in a better position to make recommendations on how to treat the old and new cutoffs (letter from Lt. Col. Heme - January 2, 1979).

Sincerely,



Joseph N. Alexander  
Commissioner

cc: Senator Marv Hanson  
Representative Nysether  
Charles A. Hughlett  
Roger Holmes  
Larry Seymour  
Vonney Hagen



NCSFD-D

25 February 1979

Mr. Charles A. Huphlett  
Acting Regional Director  
Region III  
U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

Dear Mr. Huphlett:

This will confirm our telephone conversation of 21 February 1979 concerning the Roseau River flood control project.

In the fall of 1977, the Roseau River flood control project was modified at the request of the U.S. Fish and Wildlife Service. The modification consisted of the addition of a series of low profile control structures. Installation of those control structures was to serve as backup to permanent fixing of side-ditch inlet elevations to provide control over future wetland drainage which may be attempted as a result of the project. Recently completed studies by the involved agencies have raised serious concerns for project-related impacts on the Roseau River fishery. One of these concerns was obstruction of fish movement which could be caused by the low profile control structures. A major issue appeared to be whether or not the usefulness of the structures as secondary or backup controls on drainage would offset the adverse impacts on the fishery. The impacts on the fishery appear to be of greater importance. The diversion structures in the channel cutoffs, added at our initiative to maintain flows in the natural channel, should reduce adverse effects on the stream fishery.

I would appreciate your views on whether or not the low profile control structures should remain a project feature. I would also like to know if you concur in the desirability of retaining the diversion structures in the channel cutoffs.

Sincerely,

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer





UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION V  
230 SOUTH DEARBORN ST  
CHICAGO, ILLINOIS 60604

FEB 26 1979

Colonel Forrest T. Gay, III  
District Engineer  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Gay:

We appreciate your letter of January 23, 1979, in regard to the proposed Roseau River Flood Control Project in Roseau and Kittson Counties, Minnesota. Your letter provided the U.S. Geological Survey's (U.S.G.S.) independent assessment on the ability of the lowhead dams to prevent drainage of wetlands adjacent to the Roseau River. This independent assessment by U.S.G.S. was conducted to address our concern for the protection of these wetlands and our request of December 12, 1977 to Mr. Bruce Blanchard of the Department of Interior. At that time, we also expressed concern that water quality not be degraded as a result of the flood control project. Our concern for maintenance of water quality has also been expressed at meetings between members of our staffs.

The U.S.G.S. has concluded that the lowhead dams will prevent the future drainage of wetlands in the watershed. While construction of lowhead dams may solve the wetland problem, their use may also create a significant water quality and fisheries impact. The Roseau River is an excellent sport fishery river and is classified as a 2B stream by the Minnesota Pollution Control Agency. The construction of the lowhead dams will essentially eliminate this fishery. Before the construction of these dams can occur, it must be shown that the dams and the impoundment of the Roseau River will not result in violation of the antidegradation standards of the Water Quality Standards for the State of Minnesota.

In addition to complying with State water quality standards, the project will have to comply with Section 404 of the Clean Water Act. Any disposal of dredge or fill material must comply with regulations established under Section 404(b) of the Clean Water Act. In order to assess the impacts upon the entire aquatic resource, a 404(b)(2) determination must be conducted and should be included in the revised draft environmental impact statement. The procedures for the 404(b) determination are provided in the regulations published in the September 5, 1975 Federal Register (40CFR230).

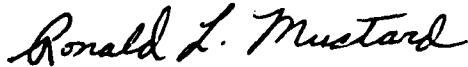


-2-

While it appears that lowhead dams could prevent further drainage of adjacent wetlands, all issues of environmental impact of the flood control project need to be assessed in the revised draft EIS. Also, all alternatives should be addressed, in order to assure that adverse impacts are minimized.

We appreciate your providing us with the U.S.G.S's results. If you or your staff have any questions in regard to our comments, please contact Mr. William D. Franz, Environmental Impact Review Staff, at 312/353-2307.

Sincerely yours,

A handwritten signature in cursive script that reads "Ronald L. Mustard".

Ronald L. Mustard, Director  
Office of Federal Activities





## MINNESOTA CONSERVATION FEDERATION

PUBLISHERS OF "MINNESOTA OUT-OF-DOORS"

ROOM 218C • 790 CLEVELAND AVENUE SOUTH • ST. PAUL, MINNESOTA 55116

PHONE [612] 690-3077

February 9, 1979

Colonel Forrest T. Gay, III  
Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Dear Col. Gay:

Thank you for the information on the findings of the U.S. Geological Survey (USGS)—that the low-head in-channel dams and side-ditch inlet-control structures will prevent secondary drainage of wetlands which otherwise would result from the proposed Roseau River flood control project.

The potential drainage of thousands of acres of wetlands—wetlands desperately needed for wildlife habitat, ground water recharge, alleviating flooding, etc.—was as you suggest a major concern of the Minnesota Conservation Federation. We certainly welcome this latest information, assuming the USGS findings are correct.

We remain very much concerned about what channelization of the Roseau River will do to the fisheries value of the river, said by some people of authority to be one of the finest warm water fisheries in the nation. However, this concern is not nearly as important to us as potential wetland drainage.

In studying this proposed project over the past several years we have tried (unsuccessfully) to determine the extent of its need—exactly how many land owners (and acres) will benefit and to what degree. It seems this information should be pinned down and made public as a "balance" against inevitable environmental damages and the expenditure of some \$18 million in public money.

Thank you again, and thank you for all your past cooperation in our efforts to approach this proposed project sensibly and in the best interest of the people of Minnesota.

Sincerely,

Al Farnes, Chairman  
Natural Resources Committee

C-45

cc: Joe Alexander, DNR Commissioner

AFFILIATED WITH THE NATIONAL WILDLIFE FEDERATION

MILT PELLETIER  
President  
Duluth, Minnesota

GORDON MEYER  
First Vice President  
Burnsville, Minnesota

LEN HOCKERT  
Second Vice President  
Minneapolis, Minnesota

DON GUNDERSON  
Secretary  
Minneapolis, Minnesota

HOMER LUIK  
Treasurer  
Minneapolis, Minnesota



WCSND-1

7 March 1979

Mr. J. I. Farnes, Chairman  
Natural Resources Committee  
Minnesota Conservation Federation  
790 Cleveland Avenue South  
St. Paul, Minnesota

Dear Mr. Farnes:

Thank you for your letter of 9 February 1979 concerning the Moskau River flood control project. In a continuing effort to keep you informed on matters relating to the project, I am furnishing you the following information.

Recently completed studies concerning the Moskau River fishery have raised doubts as to whether or not the adverse impacts on the fishery caused by the low profile control structures would be offset by the value of the structures as secondary control of future wetland drainage which may be attempted as a result of the project. As you know, the control structures were added to the project in September 1977 at the request of the U.S. Fish and Wildlife Service (FWS) to provide secondary or backup control to permanent fixing of side-ditch inlet elevations to control project-related drainage. I have discussed the effect of the control structures on the stream fishery with Mr. Charles Hughlett, Acting Regional Director of the FWS and Mr. Joseph Alexander, Commissioner, Department of Natural Resources and have requested their views on the matter. It appears that the adverse effect on the fishery caused by including the structures in the project may be an overriding concern.

We have been aware of concerns regarding the beneficiaries of the project. The Environmental Impact Statement currently on file with the Environmental Protection Agency discusses in general terms the effectiveness of the project and its beneficiaries through presentation of average annual benefits due to reduction in flood losses, listing of the degree of protection



WCSLD-6

Mr. Al Farnes

7 March 1979

afforded in various reaches, and reduction in flood stages due to the proposed project construction. In my letter to you of 10 May 1977, I forwarded the information I had received from the managers of the Watershed District concerning the project-related reduction in flood damages for 48 private homes, 24 businesses and one school facility in Roseau, as well as 214 farms downstream. The managers of the Watershed District have furnished me with the list of benefited property owners. I am forwarding a copy of that list to you. Further, I am sending you a copy of the economic reanalysis we have recently completed in preparation for issuing our Environmental Impact Statement supplement. This reanalysis was made because the economic data included in our earlier reports and Environmental Impact Statement was becoming outdated. The report of the reanalysis describes in detail the derivation of average annual benefits by relating local economic and land data to areas inundated by floods of various frequencies.

I trust you will find this information helpful in your evaluation of the project. We are continuing our efforts to develop a much needed flood control project for the Roseau River area with a minimum of adverse environmental impacts. When it is completed, you will be furnished our draft Environmental Impact Statement supplement for comment.

Sincerely,

2 Incl  
as stated

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer



NCSFD-B

12 March 1979

Mr. Joseph W. Alexander  
Commissioner  
Minnesota Department of Natural Resources  
Centennial Office Building  
St. Paul, Minnesota 55155

Dear Commissioner Alexander:

This letter is in response to your letter of 13 February 1979 concerning the Roseau River flood control project and further addresses the matters we discussed by telephone on 1 March 1979.

Your letter of 13 February 1979 stated that protection of wetlands could be effected through a combination of fixing the side ditch inlets plus regulatory control by the project sponsor. I agree with that conclusion. However, in regard to your recommendation that regulatory control be supervised by the Corps of Engineers, our authority in that regard is limited. As I agreed with former Commissioner Robert Herbst, our concerns have been expressed to the local sponsor regarding construction of new drains following completion of the project and the adverse impact these drains would have on the project. A discussion of this has been included in my Statement of Findings, included with the project Environmental Impact Statement. This is the extent of our authority within the authorization for the project. Work in the river itself or in adjacent wetlands would be subject to Section 404 of the 1977 Clean Water Act. This means that activities involving the placement of dredged or fill material would require a permit from the Corps of Engineers. The law provides that the program can be assumed by the State, in which case the Section 404 permit would have to be obtained from the State of Minnesota. In either case, I do not believe that permits which would allow for additional drainage would be favorably viewed by a permit-issuing body. However, I recognize that this law does not prevent drainage, as such, if the project does not involve the placement of the fill material in the wetlands.

As you know, the series of low profile control structures were added to the project in September 1977 at the request of the U.S. Fish and Wildlife



NCS&D-D

12 March 1979

Mr. Joseph N. Alexander

Service. Installation of these control structures was to serve as backup to permanent fixing of side-ditch inlet elevations to provide control over future wetland drainage which may be attempted as a result of the project. Recently completed studies have raised concerns over obstruction of fish movement in the river which could be caused by the control structures. It appears that the usefulness of the control structures as secondary or backup controls on drainage would not offset the damages to the fishery. Thus, it appears the structures should be eliminated.

I would appreciate your views on the project without any in-stream control structures. I would also like your thoughts on the desirability of retaining the cutoff control structures as a project feature. Finally, I would like to know if there are any other DNR concerns which would delay the project or cause you to oppose it.

Sincerely,

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

APR 30 1979

Colonel Forrest T. Gay, III  
District Engineer  
U.S. Army Corps of Engineers  
St. Paul District  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Gay:

This responds to your February 23, 1979 letter which requested our views on whether low profile control structures should remain a project feature of the Roseau River flood damage reduction project and whether diversion structures should be retained in the channel cutoffs.

The diversion structures should be retained; however, we now believe that the low profile control structures should be deleted as a project feature. Our rationale for this decision follows.

Recent fish sampling data supplied to us by your staff and by the Minnesota Department of Natural Resources indicates an exceptionally high quality game fishery exists in the Roseau River. Installation of low profile control structures would, in our estimation, have adverse fishery implications during low flow periods. At flows less than 500 cubic feet per second (which occurs 84% of the time), the Roseau River will be converted to a series of pools with only an inch to several inches of water passing over the dam crests. This will bar fish movement and may result in lowered oxygenation in portions of the river, particularly during the winter months.

While the fishery impacts of the low profile control structures are predictable and adverse, the effectiveness of these structures in preventing ancillary drainage is difficult to quantify. The structures were intended as an adjunct to permanently controlled side-ditch inlets in preventing increased drainage. This partial redundancy appeared appropriate in our previous review of the project before the value of the Roseau River fishery became defined to its present extent. In the interest of protecting this fishery, deletion of the low head dams is now recommended.

Wetland protection formerly afforded by these dams should be accomplished via some form of local restrictions and/or federal or state regulatory program. We understand that the Corps' 404 authority could be limited to wetlands adjacent to the Roseau River. Since ancillary wetland drainage has heretofore been one



of the Service's largest criticisms of this channelization project, we recommend in the absence of low profile control structures, that the Corps assume discretionary Section 404 jurisdiction over important wetland basins capable of being drained once the project is completed. We would be happy to assist in the delineation of these areas. Our agreement to exclude low head dams from the Roseau River project design is further predicated on the establishment of side ditch inlet control structures at their pre-project invert elevations as known at this date to help limit wetland drainage to its present extent. We have recently been informed that your agency proposes to establish these inlet control structures at the elevations existing at the time of project construction. This is unacceptable to the Service because it will undoubtedly encourage considerable inlet deepening prior to construction, thus increasing rather than limiting the wetland drainage capability of the project. We are aware that you have elevations for the existing side ditch inlets on both banks of the Roseau River through the project area and request that this data be used as a basis for establishing permanent invert elevations.

We look forward to working with your staff on possible in-stream habitat improvement features to mitigate the fishery losses that will result from this project even without low profile control structures and in the delineation of significant wetlands potentially drainable by the project. We request that a coordinative meeting be held between Corps, Minnesota Department of Natural Resources, and Service representatives in the near future to discuss these matters.

Sincerely,

*Charles A. Hughes*

cc: MN DNR





## United States Department of the Interior

GEOLOGICAL SURVEY  
702 Post Office Building  
St. Paul, Minnesota 55101  
April 30, 1979

Colonel Forrest T. Gay, III  
District Engineer, St. Paul District  
U.S. Army Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Gay:

We have reviewed the Roseau River Flood Control Project again, as you requested last week. The project plan now includes two major changes from the plan described in the supplementary data that we reviewed last summer (see letter of November 7, 1978). These changes are (1) deletion of the in-channel low-head dams, but inclusion of low diversion structures in the cutoff channels to direct low flows through the old meander channels, and (2) a new schedule of side-channel structures at ditch inlets to the Roseau River.

The most obvious change, of course, is that absence of low-head in-channel dams will allow the low-water profile to recede to elevations near the thalweg, and construction of a channel for cutoff number 8 will effectively drain the Roseau Lakebed.

An analysis of the 85 ditch inlets listed in the new schedule shows that 38 of the ditches will have closed conduit drop structures near the river banks. An additional 10 of the ditches will have open flume drop structures. Two ditches will be plugged and connecting channels dug to adjacent ditches upstream from drop structures. Thus, 48 structures will effectively limit the potential for side drainage in 50 ditches by virtue of the opening size and invert elevation.

At 30 ditch inlets there will simply be an open channel connection, or, no work will be done, i.e., no change made from existing conditions. At the 5 remaining ditches, other treatments are proposed that are not expected to change the potential for side drainage.



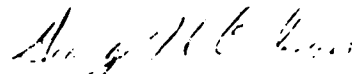
ONE HUNDRED YEARS OF EARTH SCIENCE IN THE PUBLIC SERVICE



In summary, the 48 drop structures will effectively limit potential for side drainage to that for preproject conditions, and at 35 there will be essentially no change in potential. The major effect of removing the low-head in-channel dams will be drainage of Roseau Lakebed by the unrestricted channel constructed for cutoff number 8.

Sincerely,

FOR THE DISTRICT CHIEF



George H. Carlson  
Supervisory Hydrologist





# National Wildlife Federation

1412 16TH ST., N.W., WASHINGTON, D.C. 20036

202-797-6800

May 8, 1979

Col. Forrest T. Gay, III  
District Engineer  
St. Paul District, Army Corps  
of Engineers  
1135 U.S. Post Office &  
Custom House  
St. Paul, Minnesota 55101

Dear Col. Gay:

My trip to Minnesota on the Roseau project was a pleasant and instructive one, thanks primarily to you and your staff. I particularly want to commend Bill Slocum, who proved to be a cordial and informative host on our site visit. The local sponsors were also very helpful and, somewhat surprisingly (in light of the controversy that has dogged this project), extremely affable.

Now down to business. After seeing the site under this year's record flood conditions, it is obvious that landowners within a relatively broad band along the river and below the City of Roseau (which apparently did not suffer any measurable flood damage this year) are being adversely affected. However, the factors contributing to these flood conditions, and especially the comparative importance of each factor, do not seem to be well understood. Some of the flooding is obviously attributable to the 1914 channel modifications, which have allowed vegetation to take hold on the carelessly placed spoil banks. An additional, perhaps even more significant, cause is the continuing upstream drainage of wetlands in the Sprague Creek and Hay Creek tributaries. It would be interesting to see a quantification and comparison of the contributions of these two factors to flood stages. As I understand it, no such comparison exists.

I point this out to illustrate that the flood problem here is, like most rural flooding problems, a man-made one. From the perspective of the local landowners, of course, it makes little difference what caused the flood; they just want the damn water off their land. But from a conservationist's perspective, the channelization (i.e., destruction) of 45 miles of free-flowing river to counteract other hydrologic modifications (which themselves



Col. Forrest T. Gay, III  
May 8, 1979  
Page Two

were responsible for the destruction of fish and wildlife habitat) is simply compounding the environmental damage, not to mention aggravating the downstream flooding problem. For that reason (and because we continue to have doubts about the national interest in this project) the National Wildlife Federation would be hard put to support channelization over nonstructural alternatives, even those with a higher economic cost.

However, as we discussed, NWF would be willing to withdraw its opposition to the project and agree not to pursue action to delay or halt the project provided that certain conditions--the six I presented in your office--are satisfied. To avoid any misunderstanding regarding these six recommendations, I thought it would be well to put them in writing.

#### 1. Conservation Easements

This would involve, first, the identification of all privately-owned wetlands within the project area; and, second, the execution by each landowner of a legal instrument--an easement--for each wetland on his/her property, guaranteeing that such wetland will not be drained. This device is a required measure under the Soil Conservation Service's Channel Modification Guidelines (copy enclosed). The St. Paul District used the easement approach on the South Fork of the Zumbro River at Rochester, Minnesota. In short, there should be no problem finding examples for this approach as well as model easements. Just in case, I am enclosing a list of Corps' projects involving nonstructural control measures recommended by the Corps since 1 Jan. 1970.

During our site visit, I learned that many of the wetlands in the Roseau watershed are presently publicly-owned, and therefore not covered by the easement approach. Even though publicly-owned now, these wetlands may be sold and drained in the future. Thus, we recommend that the Corps explore the possibility of obtaining an agreement with the appropriate state agency which would require that any such sale be conditioned upon a no-drainage easement.

#### 2. Existing Ditches

Present project design calls for fixing the 85 side ditch inlets at unspecified "pre-project" elevations. We recommend that those elevations be set at 1974 levels and that the structural modifications needed to "fix" the ditches at those elevations be



Col. Forrest T. Gay, III  
May 8, 1979  
Page Three

done first, well before the dragline arrives. Further, the cost sharing agreements must specify that the local sponsors are responsible for maintaining the side ditch inlets at the fixed elevations. Finally, a monitoring program should be established to require the local sponsor to periodically check these structures and report any violations to the Corps.

### 3. New Ditches

The cost sharing agreements must also specify that no new ditches are to be constructed in the project area which would permit drainage into the channelized Roseau River. I understand that the Watershed District has the authority under state law to prohibit such drainage.

### 4. Individual 404 Permits

As a further precaution against secondary drainage, we recommend that the Corps, under its 404 jurisdiction, require individual, as opposed to nationwide, permits for all drainage activities in the watershed involving the disposal of dredge or fill material into wetlands or other waters of the United States. Perhaps the easiest way to accomplish this is by publication of a Notice of Intent in local newspapers describing the type of activities which will require 404 permits and explicitly waiving the Corps' right to regulate these activities under a nationwide permit. Cf. 33 C.F.R. § 325.5(e).

### 5. State Ditch 51

As an alternative to channelizing the lower 6 miles of the River, which MDNR considers to be the best walleye spawning habitat in the project area, we recommend using State Ditch 51 as a flood by-pass. We understand that this alternative has been examined by your staff and has been found technically and hydrologically feasible. What is needed now is a detailed comparison of the costs and benefits--environmental as well as economic--of the proposed 6 miles of channelization and the State Ditch 51 alternative. Included in this analysis will be the incremental impacts, if any, on Canadian interests downstream. However, in light of the overall environmental damage attributable to this project, the Ditch 51 alternative should not be rejected on the ground that it is not "cost-effective" in comparison to channelization. Assuming the analysis shows that the Ditch is more costly, we would nevertheless expect it to be adopted unless those costs were grossly out of proportion to the costs of channelization.



Col. Forrest T. Gay, III  
May 8, 1979  
Page Four

To avoid any increase in the local sponsors' cost sharing obligation, we recommend that the Ditch 51 alternative be treated as a mitigation measure for the fishery (thereby avoiding the problem of "mitigating" the secondary drainage problem, which adoption of the other recommended measures is designed to prevent). As a fishery mitigation measure, the cost differential between the Ditch and the channelization would become a non-reimbursable federal cost, thus eliminating any objections by the local sponsors.

I will reserve comment regarding the incremental impacts on the downstream Canadian interests until we see exactly what additional impacts, if any, are attributable to the Ditch 51 alternative. Even if some incremental damage is involved, however, I do not believe that whatever time may be required to obtain the agreement of the Province of Manitoba and the concurrence of the International Joint Commission is an adequate reason for rejecting this alternative. The negotiations regarding flood damage from the proposed channelization are still underway; whatever additional damage is attributable to the Ditch 51 alternative can simply be factored into those negotiations.

#### 6. Elevated Floodway

We recommend construction of an elevated floodway through Big Swamp as an alternative to channelization in that ecologically sensitive area. Again, your staff has concluded that the floodway is technically and hydrologically feasible (there are existing structures of this type elsewhere in the St. Paul District, I am told). There is no problem with local sponsors because the Swamp is publicly owned and no acquisition of private property is required. The only question is what incremental effect it might have on the Canadian flooding problem. That piece of information should not be difficult to obtain.

Restricting the elevated floodway to the Big Swamp represents a compromise to two environmentally preferable alternatives, namely, an elevated floodway throughout the entire 45 miles of river, and stopping channel work at the edge of the Swamp (and paying damages to landowners in the Two River watershed instead of to Canadian landowners). Further compromise on this point is doubtful.

Some of the foregoing recommendations should be relatively easy to reach agreement on; others will take some time and study. Although we are anxious, as I know you are, to resolve this problem as quickly as possible, it may not be physically possible to obtain all the information and iron out all the details before your scheduled departure. Perhaps we should shoot for an "agreement in

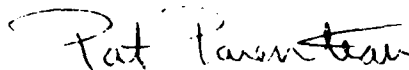


Col. Forrest T. Gay, III  
May 8, 1979  
Page Five

principle" on the points set forth in this letter by June, and leave the details to your successor, Col. Badger. If you feel there are major obstacles to accomplishing any of these recommendations we should definitely discuss them further as soon as possible.

I look forward to working together towards a solution to the fish and wildlife problems involved in the Roseau project. I am convinced that, with your continued cooperation and with the technical support of your staff, we can get there.

Sincerely,

  
Patrick A. Parenteau  
Counsel

Enclosures *1-100 file*

cc: Charles Griffith, NWF Reg. Exec.  
Gordon Meyer, Pres., Minnesota Conservation Federation  
Jim Ross, Ed., Minnesota Conservation Federation  
Joseph Alexander, Commissioner, Minnesota Department of  
Natural Resources  
David Zentner, Izaak Walton League  
Ronald Mustard, U.S. Environmental Protection Agency,  
Reg. V  
Harvey Nelson, U.S. Fish and Wildlife Service, North  
Central Reg.  
Howard Degerness, Pres., Roseau Watershed District





STATE OF  
**MINNESOTA**  
**DEPARTMENT OF NATURAL RESOURCES**

CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155

OFFICE OF THE  
COMMISSIONER  
(612) 296-2549

May 29, 1979

Forrest T. Gay III  
Colonel, Corps of Engineers  
District Engineer, St. Paul  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Gay:

The following comments are furnished in response to your letter of March 12, 1979 concerning the Roseau River flood control project.

The Department of Natural Resources responsibilities require that we provide for the wise use and development of our natural resources with careful consideration of minimizing adverse effects on the land and water resources of the state.

In recognition of the local flooding problems, the Department of Natural Resources wishes to work with the U.S.C.E. and local people in developing a project which will minimize the flooding of lands along the Roseau River without causing major problems with the natural resources of the area. One of the major areas of concern, as the Department has previously noted, is the protection of fish and wildlife resources and habitat in the area while still providing protection from flooding; and we have in the past advocated the accomplishment of these objectives with multi-purpose impoundments on the watershed.

If the various mitigation measures discussed herein are provided throughout the project area, the Department of Natural Resources should have no major problems with the project in respect to fish and wildlife values. Concerns over values or issues in addition to fish and wildlife aspects will be addressed in the E.I.S.

The potential for secondary drainage will be minimized if (1) all of the side ditch inlet control structures are placed at their previously established inlet elevations, (2) state and federal permits clearly state that no new inlets into the river will be allowed without appropriate review, and (3) the Corps assumes discretionary 404 jurisdiction over important wetland basins capable of being drained if the project is implemented.

Having addressed the problem of induced drainage, our remaining concern is the mitigation of adverse impacts to the Roseau River fishery and adjacent wildlife resources resulting from the proposed project. The elimination of the low head dams in the

C-59

AN EQUAL OPPORTUNITY EMPLOYER



Colonel Gay  
May 29, 1979  
Page Two

main stream will help maintain fish migration without diminishing the capacity of the stream to carry away flood water. The utilization of cutoff control structures would further mitigate anticipated damage to fish and wildlife resources. Mitigation in this project area is absolutely necessary because the Roseau River is the major warm water stream and fishery resource in this area of the state. It also has substantial wildlife resources that could be adversely affected by the U.S.C.E. project. Recommended mitigative features will be addressed in the state's E.I.S. on the Roseau River Flood Control Project. In addition to one bank excavation, revegetation of channel slopes, etc. and the previously mentioned side ditch inlet plugs, the following features need to be incorporated into the Corps project:

1. A dike utilizing excavated spoil should be placed on mineral soils to a height of eight feet on the north side of the channel through Roseau Lake and similarly on the south side of the channel in Big Swamp immediately west of Badger Creek to facilitate development of future waterfowl impoundments.
2. Appropriate measures will be needed at upstream ends of natural channel loops in old cutoffs (oxbows) to prevent sedimentation in the old oxbows during construction phases of the project, until channel banks and slopes are stabilized.
3. Rip-rapping will be necessary on the outside of all meanders that will be subject to erosion.
4. Care should be taken to preserve existing wetlands or potholes within the project area and where wetlands are eliminated or degraded as a result of channelization, they must be replaced or restored within the area.
5. An easement should be obtained and a public access to the river should be developed in the vicinity of County Road 7 (T. 163, 164; R. 44-45; S. 1, 6, 31, 36).
6. Replacement in acreage of wildlife management area lands lost to channelization either in kind or with wildlife lands of equal or greater value. This must be coordinated through the watershed district.
7. New channel cutoffs should serve to conduct high flows, but existing meanders should be retained for passing normal and low flows. Diversion structures would be necessary on new cutoffs nos. 1,3,5,6,7,8,9,10A and 10B. These diversion structures or at least the surfaces that may be subject to erosion must be rip-rapped; large



Colonel Gay  
May 29, 1979  
Page Three

rubble and boulders placed in the channel at these points should provide some cover for various fish species. Detailed design of the structures should receive Department of Natural Resources review.

8. Permanent plugs with drawdown capabilities should be placed on the downstream end of old cutoffs (oxbows) 2 through 7 to improve waterfowl habitat. The plug on oxbow #7 should be placed approximately 225 yards north of the outlet to maintain existing waterfowl habitat and northern pike spawning habitat.
9. Various kinds of instream structures may be needed in the channels after construction in order to mitigate fish habitat losses. The structures may consist of artificial gravel and rubble riffles as well as polls and other types of cover that would be maintained by properly designed current deflectors and rip-rapping. Installation of these structures in a low flow channel during the main construction phases of the project would make most of them ineffective due to erosion, siltation and sedimentation while the channel stabilizes. Prior to project implementation it will be necessary to dedicate construction funds for establishing these structures after the river has stabilized. Design and placement of these structures must be coordinated with Department of Natural Resources Fisheries personnel.

In addition to the foregoing, there are two modifications of the proposed project that need to be considered as means of avoiding severe fish habitat destruction in a substantial sector of the river. These are an elevated floodway through Big Swamp and the use of State Ditch No. 51 as a high-flow by-pass. These features should be capable of handling runoff from the 10 year event. The floodway would begin at the east line of section 30, T. 163N., R. 42W, downstream to State Ditch No. 51 at NW $\frac{1}{4}$  of S. 17, T. 163, R. 44W. The elevated floodway would be located adjacent to the existing river channel and 3 feet above the river thalweg. In addition to the floodway in Big Swamp, the use of State Ditch No. 51 as a high flow by-pass to the existing channel may be desirable to help maintain one of the best areas of natural fisheries habitat in the Roseau River project area. This feature should allow discharges up to approximately 1000 cfs to flow through the existing 6.6 miles of natural channel between the upstream and downstream ends of State Ditch No. 51. Utilization of State Ditch No. 51 would eliminate the need for new cutoffs 1 and 3.



Colonel Gay  
May 29, 1979  
Page Four

It should be noted that the Department of Natural Resources is working with local governments who have authority to establish local ordinances for floodplain management to assure that there is compliance with the Minnesota Floodplain Management Act, Minnesota Statutes, Chapter 104, and related rules. The willingness of the local governments to cooperate in this effort will determine the final disposition of the project with respect to Department of Natural Resources permitting and controls.

Yours truly,

By  , Deputy  
Joseph N. Alexander  
Commissioner

<sup>t</sup>  
cc: Larry Seymour  
Chuck Burrows  
Merlyn Wesloh  
Oliver Jarvenpa



Department of the Army  
St. Paul District Corps of Engineers  
1135 U. S. Post Office and Courthouse  
St. Paul, Mn. 55101

NCSDE

6 June 1979

Mr. Patrick A. Parenteau, Counsel  
National Wildlife Federation  
1412 - 16th Street N.W.  
Washington, D.C. 20036

Dear Mr. Parenteau:

First of all, let me thank you for accepting my offer of a comprehensive briefing on the Roseau River flood control project and an on-site tour with the project sponsor. Your willingness to take the time to do this is an indication that dedicated people with honest differences of opinion can work together toward mutually acceptable solutions.

Now let me respond to your 3 May letter. There are a number of significant issues related to recommendations you have made, and my discussions on these are contained in the following paragraphs, numbered to coincide with your paragraph numbers.

1. Execution of the conservation easements for all privately owned wetlands could be a difficult matter. The acquisition of these easements will, no doubt, require payments since the owner will lose most economic benefit he may have in the land. The maintenance and enforcement of the easement rights might involve future costs. Since the authorization for this project requires that the local sponsor provide necessary lands, easements, and rights-of-way and maintain the completed project, we cannot implement the easement action at Federal expense. In earlier studies for this project, we have identified approximately 1,180 acres of land in private ownership which may drain without further ditch construction. All other lands which might be drained to the river would require legal action or construction, either of which should carry the requirement for necessary mitigation. We will strongly urge the local sponsor to acquire conservation easements on 1,180 acres of privately owned wetlands in the project area. We have approached the managers of the Watershed District on this matter and they have indicated willingness to consider the easements.

2. We have the elevations for the 85 side ditch inlets in the project reach based on topographic surveys taken in 1967 and 1974. We will fix the inlet invert elevations using this information. The local sponsor is required to operate and maintain the project in conformance with the design criteria. We will furnish the Roseau River Watershed District an operations and maintenance manual when the project is completed. This manual will contain the



6 June 1979

Mr. Patrick A. Parenteau, Counsel

specifications that the inlet elevations, as constructed, must be maintained by the sponsor. The Corps annually inspects each project to assure that operation and maintenance are in conformance with the requirements of the manual.

3. Because of the problems to the functional design of the project which could be caused by additional future drainage, we will include in the operation and maintenance manual a requirement that all future construction of new ditches that outlet into the project channel must have the approval of this office. This will provide the opportunity for control on future ditch construction.

4. Discretionary authority to require individual 404 permits can be exercised if warranted by concerns for the aquatic environment. This is determined by applying the EPA Guidelines (40 CFR 230) to the area and activities in question. I have directed my staff to prepare such an analysis and will exercise discretionary jurisdiction, if warranted. Work for this analysis is currently under way. As you know, future District Engineers would not necessarily be bound by such a decision.

Before going into specific discussions of the State Ditch 51 alignment and the elevated floodway, I would like to emphasize our efforts to mitigate adverse impacts on the fishery in the entire project reach. While concerns have been raised by the Minnesota DNR for the lower project reach, concerns have been raised by local interests to protect the fishery in the upper reach and specifically in the Roseau Lakebed area. A boat launching ramp maintained by a local sportsman's group is located approximately 6 miles from Roseau near the lakebed. Following development of fishery mitigation measures for the entire project, it may be more practicable to mitigate fishery losses with measures incorporated into the proposed project rather than alter the project as you have suggested. The fishery mitigation would include one bank excavation, diversion structures in new cutoffs to maintain low and normal flows in the natural channels at these cutoffs, riffles constructed by deposition of gravel and boulders in the modified channel, structures for maintenance of pools during low flow periods which do not obstruct migration of game fish, and other measures which may be identified during preparation of the State EIS and supplement to the Federal EIS. The total cost of the proposed mitigation measures is approximately \$3.4 million or about 17 percent of the total project cost. My comments on the proposal, related to your paragraph numbers, are as follows.

5. Under the authorization for the project, the local sponsor is required to furnish lands and rights-of-way and alter highway bridges required for the project channel. Calling the Ditch 51 cutoff a mitigation feature would not alter this requirement. The increased costs for rights-of-way and bridge relocations must be borne by the local sponsor. Preliminary cost estimates show that the Ditch 51 alignment would be approximately double the proposed alignment in this reach. Cost breakdowns are as follows:



NCSDE

Mr. Patrick A. Parenteau, Counsel

6 June 1979

Project alignment

Federal cost	\$1.43 million
Non-Federal Cost	<u>.05 million</u>
Total Cost	\$1.48 million

Ditch 51 alignment

Federal Cost	\$2.52 million
Non-Federal Cost	<u>.62 million</u>
Total	\$3.14 million

Even though the estimates are preliminary, you can see that the Ditch 51 alignment cost would be considerably more than that of the project alignment. Roseau area residents tell us there is little use of the river for fishing by local residents. Further, local residents tell us that the fish stock is frequently reduced by water freeze-outs and summer droughts. The only quantitative data we have found of Roseau area fishery use was from a survey of public use of the Roseau River Wildlife Management Area conducted in 1969. The results of this study included an estimate for the year of 7,000 user days by fishermen. The Minnesota Department of Natural Resources has been unable to furnish us with any user-day data by fishermen.

6. As promised at our meeting, I am furnishing you the flow increases into Canada caused by construction of a floodway in Big Swamp.

ROSEAU RIVER DISCHARGES AT CANADIAN BORDER

Frequency (Percent)	Frequency (Years)	Discharge Existing Conditions No Project (cfs)	Discharge With Roseau River Flood Control Project (cfs)	Increased Discharge In Canada Caused By Project (cfs)	Increase to Discharge Added by Floodway (cfs)	Increased Discharge In Canada Caused By Project With Floodway (cfs)
10	10	2,700	3,250	550	0	550
5	20	3,250	3,800	550	200	750
2	50	4,020	4,550	530	230	760
1	100	4,700	5,100	400	200	600

Study and negotiations with Canadian interests would be necessary to determine final flow increases and increased costs for payment of project related damages in Manitoba. In addition, this feature would raise construction and maintenance



NCSDE

6 June 1979

Mr. Patrick A. Parenteau, Counsel

costs in the Big Swamp reach because of the additional width of channel and extra handling of the excavated material.

While we shall withhold a final decision on these last two features until the EIS supplement is completed, it appears that the high added cost of their implementation would place a disproportionately great value on a fishery resource that has little use.

Thank you, again, for your efforts and time in reviewing the project area and discussing project related concerns. We would appreciate an early response giving us your views on our handling of your proposals for the project.

Sincerely,

FORREST T. GAY, III  
Colonel, Corps of Engineers  
District Engineer





# National Wildlife Federation

1412 16TH ST., N.W., WASHINGTON, D.C. 20036

202-797-6800

June 14, 1979

Colonel Forrest T. Gay, III  
District Engineer  
St. Paul District  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Dear Colonel Gay:

Thanks for yours of 6 June. I know your time is running out, so I will rush this reply to your response to my 8 May letter. Sticking with the established format, here are my thoughts on the six issues we are discussing.

1. Conservation easements. You have used the figure 1180 acres as the amount of wetlands "at risk" from the project. I will need to verify that with FWS and EPA. Assuming that is the correct amount, I cannot believe acquisition of easements can be that difficult or costly. Presumably the local sponsor has the authority or power of persuasion over these lands since they are owned by project beneficiaries. I don't understand why the sponsor would have to pay for lands owned by its constituents, but assuming that is the case, the cost should be modest since their market value cannot be very great. In any event the easement approach is the only certain legal mechanism for protecting these threatened wetlands, and we simply cannot give it up.

2. Side ditch inlets. Your proposal to use 1967 and 1974 topographic surveys to fix the inlets sounds acceptable, as does the operation and maintenance arrangement.

3. New ditches. Why does the Corps wish to reserve the opportunity to approve or disapprove new ditches? Why not simply prohibit new ditches (defined as those constructed post-project for the purpose of wetlands drainage)? We seem to be very close on this one.

4. 404 permits. We would accept your determination (assuming your staff analysis will support it) that individual permits should be required for activities in wetlands with the caveat that it may not bind a future D.E.



Colonel Forrest T. Gay, III  
June 14, 1979  
Page 2

5. Ditch 51. We do not agree that the user-day method is the proper basis upon which to evaluate the additional cost associated with the Ditch 51 alignment. The values we seek to protect are biological productivity, natural diversity, aesthetics and unique recreational experiences. These are not easily quantified in dollars, and they certainly cannot be measured in terms of existing fishing pressure. If they are to be "monetized," it must be done on the basis of what it would cost to replace the resource, not some particular use of the resource.

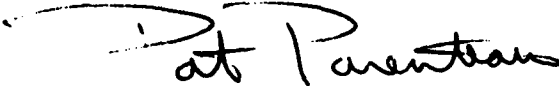
If there is a serious question regarding the biological importance of the fishery, let's get the views of the experts--MDNR and FWS. But we cannot write it off yet. I would also like your District Counsel's legal opinion regarding the question whether Ditch 51 can be considered a non-reimbursable mitigation cost under the Coordination Act.

6. Elevated Floodway. The same thing goes for this feature: the value of the Big Swamp area cannot be measured in dollars computed on the basis of user-days. When we have cost figures on this feature we will be in a better position to evaluate its reasonableness as a mitigation measure.

Reviewing the bidding, it looks as if we are in agreement on no. 2, very close on nos. 3 and 4, a good ways apart on nos. 5 and 6, and in limbo on no. 1. You have also suggested, in the nature of a substitute for nos. 5 and 6, that there are some additional upstream fishery mitigation measures which might be incorporated into the project. Without passing judgment on this approach at this time, I would be interested in learning more about those features and in knowing the views of MDNR, FWS and EPA regarding them. The question is whether upstream mitigation can offset downstream destruction in terms of habitat affected.

I look forward to our next exchange and will keep working towards resolution of our remaining problems. Thanks again for the amount of personal effort invested in this case.

Sincerely,

  
Patrick A. Parenteau  
Counsel

PAP:ks

cc's on page 3



Colonel Forrest T. Gay, III  
June 14, 1979  
Page 3

cc: Charles Griffith, NWF Reg. Exec.  
Gordon Meyer, Pres., Minnesota Conservation Federation  
Jim Ross, Ed., Minnesota Conservation Federation  
Joseph Alexander, Commissioner, Minnesota Department  
of Natural Resources  
David Zentner, Izaak Walton League  
Ronald Mustard, U.S. Environmental Protection Agency,  
Reg. V  
Harvey Nelson, U.S. Fish and Wildlife Service, North  
Central Reg.  
Howard Degerness, Pres., Roseau Watershed District



26 June 1979

Mr. Patrick A. Parenteau  
Counsel  
National Wildlife Federation  
1412 - 16th Street NW  
Washington, D.C. 20036

Dear Mr. Parenteau:

We are responding to your letter of 14 June 1979 to Colonel Forrest T. Gay, III, concerning the Roseau River flood control project. Colonel Gay's last day with the St. Paul District was 6 June 1979, and Colonel William W. Badger has now assumed the duties as District Engineer.

At present, our efforts on the Roseau River project are concentrated on coordinating the project requirements and concerns of the Minnesota Department of Natural Resources (MDNR) and the U.S. Fish and Wildlife Service with the Roseau River Watershed District, local project sponsor. The MDNR has transmitted to this office a list of concerns and requirements for the project. A copy of their letter is inclosed. We are currently working with the Watershed District managers and MDNR personnel on issues discussed in the letter. Once the issues raised by the DNR have been resolved, the managers and this office will be able to address the remaining issues raised in your letter.

We will be in contact with you when further information is available.

Sincerely,

1 Incl  
As stated

ROGER G. PAST  
Chief, Engineering Division

CF:  
Mr. Howard Degerness  
Chairman, Bd. of Mgrs.  
Roseau R. Watershed Distr.  
Roseau, MN 56571



9 August 1979

Mr. Joseph N. Alexander  
Commissioner  
Minnesota Department of Natural Resources  
Centennial Office Building  
St. Paul, Minnesota 55155

Dear Commissioner Alexander:

From our recent discussion, it now appears that we are in agreement on all matters relating to the Roseau River flood control project. This letter provides a summary of our discussions and establishes the basis for completion of the technical planning required for the project. I will present the points of discussion in approximately the same sequence as they were covered in your letter of 29 May 1979 to Colonel Gay.

First, to address the matter of secondary drainage, all side ditch inlets into the project channel will have inverts fixed at elevations based on topographic surveys taken in 1967 and 1974. Further, discretionary authority to require individual 404 permits can be exercised if warranted by concerns for the aquatic environment. This is determined by applying the EPA Guidelines (40 CFR 230) to the area and activities in question. Colonel Gay directed the General Regulatory staff of this District to prepare an analysis on this point and we will exercise discretionary jurisdiction, if warranted. Work for this analysis is currently under way. As you know, future District Engineers would not necessarily be bound by such a decision.

Following are discussions of the enumerated features described in your 29 May 1979 letter:

1. The project design includes the placing of material from the channel excavation into levees on the north side of the project channel through the Roseau Lake bed and in a reach at the outlet of Badger Creek. This was coordinated with your Department during our original design and remains part of the project.



9 August 1979

Mr. Joseph N. Alexander

2. Measures will be taken at the upstream ends of the natural channels at old cutoffs to prevent sedimentation in these channels. This has been discussed by members of our staff along with personnel from the Fish and Wildlife Service. Continued coordinated planning is necessary to complete the design of these measures.

3. Erosion protection will be installed at all locations where hydraulic and soil considerations make it necessary. Coordination on this matter will be maintained by our engineering staff.

4. From earlier coordination with your Department, we presume that concern for elimination or degradation of potholes and wetlands in the project area is based on a change in groundwater conditions because of project construction. The report of the International Roseau River Engineering Board to the International Joint Commission describes in some detail the groundwater and soil conditions in the project area. Upon review of this information we can find no reason to be concerned over lowering of the groundwater because of the project. The Big Swamp and Roseau Lake bed are areas of groundwater discharge from recharge areas in the United States and Canada. Soil conditions in the project area will preclude the possibility of significant changes in groundwater levels which would cause elimination or degradation of potholes and wetlands.

5. The matter of public access to the Roseau River at the location described in your letter has been discussed with your staff and the managers of the Roseau River Watershed District. There apparently is an existing public access at or near this point. There appears to be no problem in resolution of this item.

6. The managers of the Watershed District are working with your staff in identifying State-owned lands which may have to be replaced as a result of project construction. This matter requires further coordination between your Department, the Watershed District Managers, and Roseau County for resolution.

7. The project design has been altered to permit low and normal flows to pass through the natural channels at the new cutoffs. The new cutoffs will pass only high flows. Design of the diversion structures in the cutoffs will preclude their loss because of erosion. The design of these features will be furnished to your staff for review.

8. The permanent plugs at the old cutoffs mentioned in your letter can be installed as requested. Coordination of design for these plugs will be the subject of future meetings by our joint staffs and the Fish and Wildlife Service.



NCSED-D

9 August 1979

Mr. Joseph S. Alexander

9. A fishery mitigation plan for fishery mitigation was the subject of a meeting held on 17 July 1979 at the Fish and Wildlife Service on 17 July 1979. The meeting was held to discuss fishery mitigation in the form of altered channel in the Big Swamp reach where channel modification is proposed and in the Big Swamp reach. In the Big Swamp reach, the altered design consists of flattening the control for the bottom of the proposed channel to a depth of 2 feet above high points of the bottom profile of the existing channel. This will leave a minimum of 2 feet in depth for the channel bottom in its preproject condition. In the Big Swamp reach, the design calls for undisturbed reaches totaling approximately 1.5 miles in each of the last 2 miles on the downstream side of the Big Swamp reach. The elevated channel bottom similar to the lower 6-mile reach will be 2 feet in each mile in the balance of Big Swamp, since the design calls for a number of locations in the river following the channel centerline. Selection of the control points for the elevated channel bottom and the undisturbed reaches in Big Swamp will be coordinated with your staff and the Fish and Wildlife Service. Also, completion of site-specific design of these mitigation features will be a coordinated activity.

We have reviewed the design suggested in your letter, the use of State Ditch No. 51 and the Big Swamp bypass and the elevated floodway in Big Swamp. Preliminary cost estimates show that the Ditch 51 alignment would cost over twice as much as the proposed alignment. The estimated cost for Ditch 51 is \$3.14 million versus \$1.46 million for the proposed alignment. Construction of an elevated floodway would cause increased flows into Manitoba. Canadian officials have stated that if the channel design in Big Swamp is altered, it would result in increased flows into Canada, additional study and negotiations would be necessary for an increase in payments, for project-related damages in Manitoba. If we alter the design to mitigate fishery losses as described above, there appears to be no justification for the additional costs which would be incurred by adoption of the State Ditch No. 51 alignment and the Big Swamp elevated floodway.

My staff will continue to work with your staff and personnel of the Fish and Wildlife Service in further detail design of the fishery mitigation. As we stated at the meeting with the local interests in Roseau, our schedule calls for distribution of the Federal Environmental Impact Statement supplement in January 1980. It is my intent that we shall meet this schedule.

Sincerely,

WILLIAM W. BADGER  
Colonel Corps of Engineers  
District Engineer



AD A121 926

FLOOD CONTROL ROSEAU RIVER ROSEAU AND KITTSOY COUNTIES

3/3

MINNESOTA FINAL ENVIRONMENTAL IMPACT STATEMENT

SUPPLEMENT(U) CORPS OF ENGINEERS ST PAUL MN ST PAUL

UNCLASSIFIED

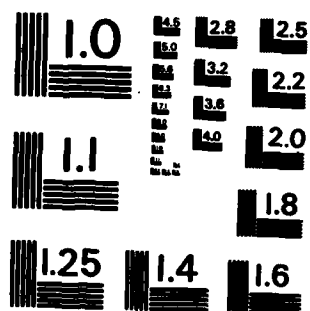
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STATE OF  
MINNESOTA

DEPARTMENT OF NATURAL RESOURCES

CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155

1517-08 Roseau River M-F.R.

August 17, 1979

Mr. William W. Badger  
Colonel, Corps of Engineers  
District Engineer, St. Paul  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

In response to your letter of 9 August concerning the Roseau River flood control project, I wish to emphasize that there is an element of Item 9 that remains unsettled. This is the stream improvement work that follows the channel widening.

We are not sure at this time in what form or at precisely what locations stream improvement structures should be placed. The planning will have to wait until the channel widening has been completed and the stream bottom has assumed the configuration it is likely to hold. Post-dredging, stream improvement, however, is a discrete construction phase that should be budgeted for.

It may suffice, for the present, to leave the matter as it is described in your letter - the construction of riffles at a number of locations in the river following the channel widening. We have acquired more information, however, since our meeting on 17 July and will be in a position to offer an estimate of costs for budgeting purposes and more information on the type of structures. We will arrange a meeting with your staff as soon as possible to further clarify this element.

Sincerely,

Joseph N. Alexander,  
Commissioner

JNA:1z

cc: C. R. Burrows  
L. Seymour  
O. Jarvenpa

C-74



ACSLD-2

✓ 31 October 1979

Mr. Joseph N. Alexander  
Commissioner  
Minnesota Department of Natural  
Resources  
Centennial Office Building  
St. Paul, Minnesota 55155

Dear Commissioner Alexander:

On 11 October 1979, representatives from your department and the Fish and Wildlife Service met with members of my staff to discuss the fishery mitigation features to be included in the Roseau River flood control project. The discussion included the design of the revised channel cross-section in the downstream 6 miles and in Big Swamp, which has been included as fishery mitigation. We agreed that when the channel design was complete it would be furnished to your department for review. Inclosed with this letter, for your review, are the following inclosures:

- a. A tabulation of proposed channel information for the lower 6-mile reach.
- b. A typical cross-section showing the elevated channel construction.
- c. A tabulation showing location and dimensions of the altered channel design upstream of the lower 6 mile.
- d. A map showing these locations.

Also, at the 11 October meeting members of your staff furnished preliminary information on riffle structures to be included in the project for fishery mitigation. Your staff members stated that the riffle information would be furnished formally to my office as soon as they had an opportunity to review the elevated channel design.



WCSED-D

Mr. Joseph N. Alexander

31 October 1979

I request your early response to this letter to minimize further delay in the project.

Sincerely,

4 Incl  
As stated

WILLIAM W. BADGER  
Colonel, Corps of Engineers  
District Engineer

CF:

Mr. Oliver M. Jarvenpa  
Chief, Ecological Services Sec.  
Division of Fish & Wildlife  
Box 25  
658 Cedar Street  
St. Paul, MN 55155

Mr. Larry Seymour  
Director, Division of Waters  
Department of Natural Resources  
444 Lafayette Road  
Space Center Bldg.  
St. Paul, MN 55101





STATE OF  
**MINNESOTA**

**DEPARTMENT OF NATURAL RESOURCES**

CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155

DNR INFORMATION  
(612) 296-6157

November 15, 1979

William W. Badger  
Colonel, Corps of Engineers  
District Engineer, St. Paul  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

The following comments and enclosures are furnished in response to your letter of October 31, 1979 concerning fishery mitigation to be included in the Roseau River flood control project. It should be made clear that this discussion pertains to item 9 of your letter of August 9, 1979 and my letter of May 29, 1979. As you have previously indicated, we are in agreement on all other items.

We have reviewed your tabulation of information on proposed channel modification in the lower 6-mile reach and the sketch of a typical cross section in this reach. We find that this work will result in a low-flow channel with an average depth of three to four feet and an average width of 40 to 50 feet. This will tend to preserve existing fish habitat in this sector.

The tabulation showing the location and dimensions of the altered channel design upstream from the lower six miles has been analyzed and comments and recommendations have been provided (see attachment A). Of these 16 field control points, we have recommended slight location shifts on only four and a substantial relocation on one. This part of the project covers the reach we have customarily referred to as the Big Swamp reach or that part of the river extending from Ditch 51 to a location about 12 miles upstream.

In Attachment B we have supplied as much detail on the location of proposed fish habitat improvement structures as is possible prior to dredging and subsequent channel stabilization. In the stretch of river between Ditch 51 and the Roseau dam we have located 58 sites for fish habitat development. Thirty-four are located between the Big Swamp reach and the Roseau dam. Twenty-four are in the Big Swamp reach and include among them the 16 control points described in Attachment A. These 16 locations will contain part of the pre-project fish habitat and will very likely lend themselves to post dredging improvement. More precise location of the other 42 sites will, of course, depend upon the stream bed configuration that develops after dredging.

Also enclosed are a map of the Roseau River showing location of recommended fishery mitigation developments, (Attachment C, 3 sheets), and an estimate of the cost of a typical structure employed in fish habitat improvement in this type of situation (Attachment D).



Colonel Badger  
November 15, 1979  
Page 2

We submit that the \$1.2 million estimated federal costs for the 58 habitat improvement structures are justified by the high quality of the existing fishery resources which will be severely diminished by channelization, and is well within the \$2.8 million saving realized by the elimination of the low head dams.

I hope this information will be helpful in forwarding your project.

Yours truly,

  
Joseph N. Alexander  
Commissioner

JNA:blt  
Enclosures



1517-01 Roseau Riv.



## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

LWR

DEC 13 1979

Colonel William W. Badger  
Dist. Engineer, St. Paul Dist.  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Dear Colonel Badger:

This responds to Mr. Fast's October 31, 1979 letter requesting Service comments on your agency's fishery mitigation proposal for the Roseau River flood control project. In addition to the above project design modifications, our review will address our understanding of various other project modifications which have been made since issuance of the General Design Memorandum (GDM). The latter modifications will be discussed if relevant to fishery mitigation in the appropriate sections.

### Lower Six Mile Reach (Below Big Swamp)

Our understanding of modifications to the project design shown in your October 1971 GDM includes the following:

1. Rather than widening and sloping the existing channel in this reach as originally proposed, an elevated channel would be constructed adjacent to the existing channel along the entire reach except in the areas of channel cutoffs, where no work would be done in or along the existing channel. The bottom of the elevated channel would be at an elevation at least 2 feet higher than the thalweg at selected control points identified by an interagency field team made up of personnel of our respective agencies and the Minnesota Department of Natural Resources (MDNR). The field identification of those control points took place the week of August 20, 1979.
2. Channel cutoffs 2 and 4 have been eliminated.
3. The remaining two channel cutoffs (cutoffs 1 and 3) would be gated at their upstream ends, thus carrying water only during high flow periods.

Your enclosure A gives bottom elevations for the elevated channel and cut-off channels for the lower six mile reach. At station 58+50 (Caribou Bridge) we note that the bottom elevation for the elevated channel (1005.6 feet above M.S.L.) is the same as the bottom elevation of the existing channel (per Plate 6 of the GDM). This is not consistent with the understanding stated





in (1) above and would appear to disperse flows across the entire channel at that location. Since that station is apparently one of only two control points selected for use in the lower six mile reach, an error at that point could have similar effects on other high spots in the channel.

As noted above, only two of seven control points downstream of Big Swamp which were identified in the joint field review were utilized. We must assume that use of the two points (at stations 58+50 and 167+00) was sufficient to maintain the required 2 feet vertical separation between the other five control points and the elevated channel bottoms at those points. Confirmation of the above would be appreciated.

The interagency field team identified a control point in the vicinity of station 110+00. We understand that bottom profiles were not prepared for that river stretch because it fell within proposed cutoff 2. We presume cross sections in that area will now have to be taken. At such time, we recommend documenting the elevation at the above-mentioned control point and using it as an additional control for the elevated channel.

We note that cutoff 1 has been shifted one river loop to the east. To our knowledge, that shift has never been discussed at previous interagency meetings. Not having had prior knowledge of the relocation of cutoff 1, we are not prepared to discuss its biological implications, if any, at this time.

With respect to cutoffs 1 and 3, we are assuming that their bottoms will be uniformly flat. To prevent the entrapment of fish during low flow periods, the channels should be sloped downward from an upstream-to-downstream perspective if they are intended to be dry during the summer months. From both fishery and waterfowl standpoints, it would be preferable to excavate the cutoff bottoms to elevations 12 to 18 inches lower than that of the first control point immediately downstream.

#### Altered Channel Design through Big Swamp

Field control point D (station 942+50) does not have a controlling effect on upstream water levels, and it offers little or no fishery mitigation potential. Point E (station 872+00) is similarly of no value as a control point, but a combination of factors makes that area highly amenable to fishery habitat development. From a fishery mitigation standpoint, it would be preferable to include point E and drop point D, if necessary.

An elevated Type 4 wetland approximately 6 acres in size lies adjacent to the river along its south bank between stations 859+60 and 969+00. South bank excavation in this area associated with either the standard channel design or elevated channel design would adversely impact or possibly even destroy that wetland. In view of its exceptionally high value as a waterfowl nesting and brood rearing area, we believe every effort should be made to avoid or minimize adverse project-related impacts to it. We recommend that the feasibility of no channelization in the area adjacent to this wetland be examined. Should the "no construction" alternative prove infeasible, we recommend you examine the feasibility of reducing the channel width in this area below the standard project design. The elevated channel design for control point F should not be implemented nor should sidecasting of excavated material into that wetland be allowed.



In conjunction with the elimination of the elevated channel design at control point F, the feasibility of adding control point G should be explored.

Your fishery mitigation proposal for the lower two miles of Big Swamp conforms to our understanding that 10% of the riverine habitat in that reach would remain unaltered. You identify two-500 foot reaches in the lower two miles (control points X and AA) where no channel excavation would be undertaken. Within that reach, control points W, Y, and Z were not included for protection. All three of those control points were rated highly by the inter-agency field team for their controlling effect on upstream water levels. We therefore recommend that the 1000 linear feet of habitat protection presently distributed between control points X and AA be divided equally among those and at least two of the three presently unprotected control points. Should this not prove possible, we recommend exploring the same distribution under the elevated channel concept.

Our last comment concerns the river reach for the first 3 miles above Big Swamp. In their review of control points in the project area, the inter-agency field team identified three control points (A'', A', and A), each of which provides water level control for approximately one mile of good quality fish habitat. In addition, A'' (approximate station 1115+00) and A (approximate station 1038+00) are located at the lower ends of small backwater areas having high value to waterfowl and spawning northern pike. We request that you explore means to protect the water levels and associated high quality fish and wildlife habitat which exists at all three control points, with particular emphasis on points A'' and A.

You must recognize that even with implementation of all the measures proposed in your October 31 letter and those additional measures proposed in this response, construction of the Roseau River flood control project would continue to result in a large loss of productive fish habitat. Within the substantial constraints imposed by hydraulic and economic considerations, our staffs have worked together to develop a plan responsive to the fishery of the Roseau River.

I am concerned that, even at this late date, our respective agencies have not developed a mutual understanding of the full range of natural resource issues involved with construction of the Roseau River flood control project. To that end, I propose that appropriate members of our staffs meet at the earliest possible date to discuss those various issues, to include mitigation of impacts to wildlife resources, the use of lands acquired under the Federal Aid in Wildlife Restoration Act, endangered species, and the issues raised in this and my letter of April 30, 1979. I believe such an exchange of views to be vital to the preparation of an adequate Supplemental EIS for this project.



These comments have been prepared under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and are consistent with the intent of the National Environmental Policy Act of 1969.

Sincerely yours,

*Charles A. Hagill*

cc: Minn. DNR, St. Paul

Charles A. Hagill  
Acting Regional Director





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

LWR

FEB 15 1980

Colonel William W. Badger  
District Engineer  
U.S. Army Engineer District  
St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

This letter provides further clarification of several points discussed in our January 21, 1980, meeting concerning the Roseau River Project. These comments correspond to the numbered items on the document provided at the meeting.

### Item 1

Deposition of spoil along the south side of the channel in the reach adjacent to the Badger Creek outlet will cause fill to be placed in a 6- to 9-acre Type IV wetland. The Minnesota Department of Natural Resources (MNR) has requested that fill be placed in this area to form the north dike for a future waterfowl management pool. MNR has neither funding nor a timetable for constructing the remainder of the pool. In fact, MNR cannot be certain that the pool will ever be constructed. The Corps should employ every means including:

1. keeping the spoil piles as low as possible;
2. keeping landward slopes as steep as possible; and
3. sidecasting spoil to adjacent higher ground--to conserve the excellent waterfowl production capability of this wetland.

### Item 5

This item discusses fixing the capacities of all ditch inlets within the project area. Since low profile control structures have been eliminated from the project plan, we have contended that ditch inlet invert elevations should be fixed at pre-1979 levels. This would effectively eliminate the possibility of draining wetlands adjacent to the channel. Fixing ditch inlet capacities will neither control nor discourage project-induced drainage. Consequently, we repeat our request that ditch inlet invert elevations be fixed at pre-1979 levels.



A related matter concerns the possibility of private landowners and/or the Watershed District relocating the ditch inlets to either side of the fixed inlets to gain greater depth and to allow drainage into the new Roseau River channel. Because present inlets are located above the ordinary high water mark of the Roseau River, it is likely that most inlet relocations could take place under the existing nationwide permit program. The same problem exists with respect to new inlets. Within the watershed, exists an unquantified (but significant) acreage of privately owned wetlands. These wetlands have not been drained to date, despite several drainage projects in the area. We suspect that their continued existence is tied to agricultural economics rather than engineering feasibility. Thus, increased emphasis on agricultural productivity could stimulate additional wetland drainage. The Corps has identified approximately 4,000 acres of private land (not now in agricultural production) which would be susceptible to drainage because of the lowered river profile resulting from the proposed project. We have requested (per our April 30, 1979, letter to Colonel Forrest T. Gay) that the Corps assume discretionary authority and require individual 404 permits for all dredge and fill activities in wetlands within the limits of influence of the proposed project. We again request that you assume your discretionary authority in this matter to reduce the threat of future widespread wetland drainage.

#### Item 8

We acknowledge that you have agreed to most of our recommendations concerning fishery mitigation. We also realize that your ability to do more is limited by hydraulic and economic constraints. Our understanding of the latest project design specifications are recapped below:

Total river miles within the project area	50.6 miles
Miles of river channel to be excavated	30.6 miles
Miles of river bypassed by new high-flow cutoffs	11.7 miles
Miles of undisturbed channel bottom as a result of benched construction	7.1 miles
Miles of undisturbed river within Big Swamp	.2 miles

In summary, our major recommendations (in addition to those measures set forth in the attached document) are:

1. The District Engineer should assume discretionary authority over valuable wetland areas in the basin as recommended



in our April 30, 1979 letter. If induced drainage does not take place, there would be a negligible burden on the Corps Regulatory Functions Branch. If induced drainage does take place, this regulation is necessary to reduce the "secondary" impacts of the project and to maintain the integrity of its design.

2. All existing inlets should be structurally fixed at their pre-project invert elevations as opposed to their pre-project capacities.
3. Some means of positive Federal agency control over additional inlets should be established for the same reasons set forth in "1" above.

Sincerely yours,

*Charles A. Heaglett*

Enclosure:  
Recap of 21 January 1980 meeting



## National Wildlife Federation

1412 SIXTEENTH STREET, N.W.  
WASHINGTON, D.C. 20036  
Phone 202-797-6800

44th ANNUAL MEETING  
MARCH 21-23, 1980  
CARILLON HOTEL  
MIAMI BEACH, FLORIDA

March 14, 1980

Colonel William W. Badger  
District Engineer, St. Paul District  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Re: Roseau Flood Control Project

Dear Colonel Badger:

I have received a copy of Mr. Hughlett's letter to you of February 15 regarding the captioned project. It appears that the project design has undergone considerable modification since last spring when I visited the area. Many of the changes appear beneficial; however, I am concerned that some of the recommendations made in our letters of 8 May and 6 June 1979 to Colonel Gay may have become lost. Could you update me on the status of those recommendations? We remain especially concerned about the secondary drainage of wetlands made possible by the project. The exercise of discretionary permit authority is no substitute for the execution of conservation (i.e., no drainage) easements by the landowners within the project boundaries. If it is true that drainage of these wetlands is not a desired purpose of the project, then this request does not appear unduly burdensome to project beneficiaries.

Sincerely,

  
Patrick A. Parenteau  
Director  
Resources Defense Division

PAP:ks

cc: Leonard D. Hockert, Pres., Minn. Conservation Fed.  
C. Griffith, NWF  
Joseph Alexander, Acting Comm., Minn. Dep't of Natural Resources  
John McGuire, Adm., EPA Reg. V, Chicago, IL



THE IZAAK WALTON LEAGUE OF AMERICA

March 17, 1980

Colonel William W. Badger, District Engineer  
U. S. Army Engineer District  
St. Paul, Minnesota  
1135 U. S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

I was very interested to receive on February 15th a copy of the letter sent to you by Charles Hughlett, Acting Regional Director, U. S. F. W. S.

Since Bill Slocum accompanied Pat Parenteau of the National Wildlife Federation and myself on a tour of the project in May of 1979, my only correspondence from the Corps was Ted Gay's June 6, 1979 letter to Pat Parenteau. I also have Pat's reply dated 6-14-79.

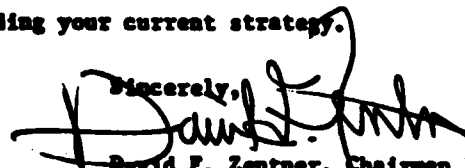
Our trip in May of 1979 was preceded by extensive correspondence and several meetings between the several parties involved in and concerned about this project.

Since you replaced Ted, I have heard nothing as to the proposed course to be followed by the Corps. I did mention to you when I met you briefly at the Great Lakes Basin Commission meeting in Superior, that I was very interested in the project, and very interested in where you perceive the final settlement to be.

If there's a potential here for concluding the strategy without fully involving all of the parties, it seems to me that strategy may have a difficult time in survival.

I look forward to hearing from you regarding your current strategy.

Sincerely,



David F. Zentner, Chairman Executive Board  
Izaak Walton League of America, Inc.  
824 First National Bank Building  
Duluth, Minnesota 55802 (218) 727-7437

National Office: Suite 806, 1800 N. Kent Street, Arlington, Virginia 22209 • Phone 703-528-1818

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JAMES M. HENRY, Vice Chairman

C-87





DEPARTMENT OF THE ARMY  
ST PAUL DISTRICT CORPS OF ENGINEERS  
1135 U S POST OFFICE & CUSTOM HOUSE  
ST PAUL, MINNESOTA 55101

REPLY TO  
ATTENTION OF: NCSED-D

4 April 1980

Mr. Patrick A. Parenteau  
Director, Resources Defense Division  
National Wildlife Federation  
1412 Sixteenth Street, NW  
Washington, D.C. 20036

Dear Mr. Parenteau:

Inclosed is a copy of my response to the letter of 15 February 1980 from the U.S. Fish and Wildlife Service regarding the Roseau River Flood Control project. Also inclosed is a list of mitigation issues for the project which I discussed with Mr. Harvey Nelson, Regional Director of the U.S. Fish and Wildlife Service and Mr. Joseph Alexander, Commissioner, Minnesota Department of Natural Resources, at a meeting on 21 January 1980.

I consider the concern for induced drainage due to project construction to be adequately addressed through fixing of side ditch inlets at pre-1979 conditions and use of permit authority, as described in my letter to Mr. Nelson. In addition to these actions, there are State and local actions which can be brought to bear against attempts at wetland drainage. Under Minnesota Statutes, chapter 105.42, a permit must be obtained from the Commissioner of Natural Resources prior to the accomplishment of any work in public waters. The State of Minnesota supports reduction of flood damages through the project. Commissioner Alexander and Mr. Larry Seymour, Director, Division of Waters, could discuss implementation of this permit activity to preserve wetlands. Further, Minnesota Statutes, chapter 112, provides, through the Minnesota Watershed Act, a means of local control of wetlands through the organization of watershed districts. The Roseau River Watershed District, local sponsor for the project, can implement methods of wetland preservation. With the interest shown by your organization and other environmental groups and the support of the State and local agencies, it should be possible to provide for reduction in flood damages along the Roseau River while protecting remaining wetlands.



NCS&D-D

4 April 1980

Mr. Patrick A. Parenteau

The environmental/mitigation issues discussed at our 21 January meeting were the results of continuing coordination with the Minnesota DNR and the US Fish and Wildlife Service. Our future efforts in development of the project will also be coordinated with these agencies so environmental issues can be resolved to the extent practicable. A full discussion and description of mitigation efforts will be included in the supplement to the project environmental impact statement. A copy of the supplement will be furnished to you as soon as it is available.

Thank you for your interest in the project.

Sincerely,

2 Incl  
As stated

WILLIAM W. BADGER  
Colonel, Corps of Engineers  
District Engineer

Ident. ltr to:  
Mr. David Zentner  
Chairman, Executive Board  
Izaak Walton League of America  
824 First National Bank Bldg.  
Duluth, Minnesota 55802



4 April 1980

Mr. Harvey Nelson  
Regional Director  
U.S. Fish and Wildlife Service  
Department of the Interior  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

Dear Mr. Nelson:

I am responding to Mr. Hughlett's letter of 15 February 1980 with clarification on two matters relating to the Roseau River Flood Control project.

The fixing of the capacities of side ditch inlets, as we propose it, is to fix invert elevations as well as other dimensions. It was not our intent to circumvent the previous agreement to fix side ditch inlet elevations but, instead, to provide a more inclusive term. Following completion of project, construction of new inlets into the river, as well as alteration of the existing fixed inlets by local interests, will be subject to Corps of Engineers control under the project. This will be the primary control along the channelized stream. Corps of Engineers permit authorities will also be in effect in the general area.

In regard to your concerns for exercise of permit authority under Section 404 of the Clean Water Act, my staff has completed its analysis of the Roseau River watershed area. Most wetlands in the watershed are subject to regulatory jurisdiction of the Corps of Engineers according to 33 CFR 323.2(a)(3). Many of these wetlands are directly adjacent to the Roseau River or to connecting ditches having an average annual flow of over 5 cubic feet per second (cfs) and, thus, are subject to individual Corps of Engineers permits according to the definitions in 33 CFR 323.2(a)(3). An unknown number of wetlands in the area are not adjacent to the Roseau River or ditches with average annual flows in excess of 5 cfs, and, thus, these wetlands are considered to be adjacent to streams above headwaters. Discharge of dredged or fill material into these wetlands is authorized by the nationwide permit in 33 CFR 323.4-2(a)(1). Under 33 CFR 323.4-4, I may require individual permits for a discharge of dredged or fill material which otherwise have been authorized by a nationwide permit if it is determined that an action individually or cumulatively adversely impacts affected waters. Presently, the lack of specific



NCSMD-D

4 April 1980

Mr. Harvey Nelson

project areas and projects does not indicate the need for exercise of discretionary authority. Although I consider it unnecessary to exercise discretionary authority at the present time, the Corps of Engineers will maintain contact with the Roseau River project area through its surveillance program and will consider the exercise of discretionary authority should information become available on specific drainage plans subject to a nationwide permit.

Following receipt of copies of Mr. Hughlett's 15 February 1980 letter, Mr. David Zentner of the Isaak Walton League and Mr. Patrick Parenteau of the National Wildlife Federation wrote to me expressing their current concerns over the project. I am inclosing copies of their letters along with a copy of my response. Furnishing a copy of this letter to them will expedite the flow of information.

Mr. staff will be continuing the coordination of implementation of the mitigation measures with your staff and that of the Minnesota DNR.

Sincerely,

3 Incl

1. Ltr fr Mr. Parenteau,  
14 March 1980
2. Ltr fr Mr. Zentner,  
17 March 1980
3. Ltr fr DE to Messrs.  
Parenteau and Zentner.
- 4 April 1980 (w/incl 2)

WILLIAM W. BADGER  
Colonel, Corps of Engineers  
District Engineer

CF:

Commissioner Joseph N.  
Alexander (MDNR)  
Mr. Oliver M. Jervenpa (MDNR-  
FWS)  
Mr. Larry Seymour (MDNR)  
Mr. Howard Degerness  
Roseau Watershed District  
Mr. David F. Zentner  
Isaak Walton League  
Duluth, MN  
Mr. Patrick A. Parenteau  
Natl Wildlife Federation  
Washington, D.C.





## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

RA

JUN 13 1980

Colonel William W. Badger  
District Engineer  
U.S. Army Engineer District  
St. Paul  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

This responds to your April 4, 1980, letter addressing our earlier comments on various elements of the Roseau River Flood Control Project. Several matters, relating to your determination that additional Federal controls over future wetland drainage/fill activities in the watershed are not needed, continue to concern us. Consequently, we are requesting clarification of several items in your April 4 letter.

With reference to your second paragraph, please explain how you intend to control the alteration of fixed ditch inlets and the construction of new inlets following project construction.

In order to put the question of individual permit authority versus Nationwide Permit authority into clear perspective, please explain your definition of "directly adjacent" as it applies to wetlands along the Roseau River. Also, the terms "Many" and "An unknown number" used to describe wetlands, subject to individual and National Permit authority, are of questionable value in assessing the need for more comprehensive Federal review of fill-related activities in the watershed. The use of these terms implies that there is uncertainty about the extent of Corps' authority to require individual permits. There are many acres of potentially drainable wetlands in the watershed which are located above the "headwaters" as defined in your April 4 letter. Consequently, a more definitive determination of the potential for future wetland drainage/fill activity through the Nationwide Permit Program is necessary. This would allow an accurate assessment of the potential biological and hydrological consequences of your decision to not assume discretionary authority over future such activities in the watershed.



A second major concern involves your intention to impose individual permit requirements on only certain selected fill activities. You have indicated you will depend upon your surveillance program to monitor conditions in the watershed and identify beforehand those drainage and fill activities likely to produce adverse impacts. We are concerned that all discharges of dredged or fill material and resultant enhanced wetland drainage will produce adverse biological, water quality, and hydrologic impacts to the Roseau River. The Corps project, by lowering the profile of the Roseau River, will make possible additional wetland drainage predominately in areas defined as "above headwaters". We are not aware of any existing mechanism for providing the Corps advance information on impending drainage activities in the watershed. The function of your surveillance program has been to document unauthorized work in the waters of the United States which has either been completed or is under way. Your surveillance section has been dependent, to a large degree, on individuals and other agencies for information on potential violations. This is particularly true in the more remote areas of the St. Paul District. Once undertaken, work authorized under the Nationwide Permit Program would not be subject to after-the-fact restoration through subsequent assumption of discretionary authority.

At the present time, we do not believe that wetlands of the Roseau River Watershed will receive adequate protection from drainage activities facilitated directly or indirectly by the flood control project. At least the above discussion raises some questions on procedure that seem to be inconsistent with some of the decisions reached at our meeting on January 21, 1980. We urge that you reconsider the concepts of (1) before-the-fact assumption of discretionary authority, and (2) conservation easements to provide adequate protection to wetlands, fish and wildlife resources, and water quality of the Roseau River Watershed.

Sincerely yours,



Harvey K. Nelson  
Regional Director

cc:

U.S. EPA, Chicago, IL  
J. Alexander, MN DNR, St. Paul, MN  
P. Parenteau, National Wildlife Federation, Wash., D.C.  
D. Zentner, Izaak Walton League, Duluth, MN  
C. Griffith, National Wildlife Federation, Mpls., MN  
G. Meyer, MN Conservation Federation, St. Paul, MN  
H. Degerness, Roseau River Watershed District, Roseau, MN





## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
TWIN CITIES AREA OFFICE  
530 Federal Building and U.S. Court House  
316 North Robert Street  
St. Paul, Minnesota 55101

IN REPLY REFER TO:

FEB 13 1981

Colonel William W. Badger  
District Engineer, St. Paul District  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Badger:

This letter provides the current views of the U.S. Fish and Wildlife Service with respect to the Corps' post-project regulatory role within the area of influence of the Roseau River Flood Control Project.

I welcome your recent decision to withdraw recognition of documented drainage ditches as waters of the United States. That decision alone will afford a number of wetlands adjacent to the Roseau River enhanced protection under the 404 Permit Program.

I continue to believe that the Corps must assume full responsibility for those wetland drainage activities which are facilitated through completion of the federal flood control project. Such drainage activities can be expected to result from improved hydraulic conditions provided by the project in the form of less frequent out-of-bank flows, faster floodwater evacuation from the floodplain and faster lowering of the river surface profile for any given flood event. These hydraulic improvements would have the effect of reducing the duration of the "backwater" effect on existing ditches, thus improving their efficiency over pre-project conditions.

Aside from conservation easements or your assumption of discretionary authority over the more important wetlands within the project's area of influence, I am aware of no mechanism currently under consideration which would protect the wildlife values of those wetlands. In that regard, I was pleased to learn recently that you have directed your staff to re-examine the question of discretionary authority as it might apply to dredge and fill activities in those wetlands in the project area currently falling within the Nationwide Permit Program. I have been apprised of the methodology being used in that study and the factors upon which your decision would apparently be based. The following is my understanding of the process underway and my comments relevant to it.



Step 1:

1965 U.S.G.S. topographic maps and 1974 A.S.C.S. aerial photos are being examined to determine the locations, extent and regulatory status of wetlands in the project area.

Step 2:

Those wetlands determined in Step 1 to have "Nationwide Permit" status would then be examined for ownership status. Wetlands presently in State ownership are reasoned to be protected against future drainage.

Step 3:

The remaining "Nationwide" wetlands would be evaluated individually against a set of criteria relating to their ecological uniqueness, productivity, and documented importance to various wildlife (endangered species, waterfowl, shorebirds, wading birds, etc.). Should an individual wetland meet one or more of those criteria and/or general 40 CFR factors related to food chain, water quality maintenance and floodwater retention functions, it would be considered for discretionary authority.

With respect to your wetland identification effort (Step 1), I have reservations regarding the use of U.S.G.S. topographic maps as a basis for determining the existence of other than permanently or semi-permanently flooded wetlands (Types 4 and 5, USDI Circular 39). With such maps, it is not possible to identify seasonally flooded wetlands by type nor can wetland boundaries be accurately determined. Aside from being seven years old, the A.S.C.S. aerial photos were taken during a period of extensive sheetwater flow. Consequently, a true picture of wetland types and boundaries cannot be obtained. Without adequate photographs and maps, it would seem extremely difficult to address such questions as adjacency, Nationwide permit status, or biological values.

The U.S. Fish and Wildlife Service has contracted with NASA to obtain 1:60,000 color infrared photographs of the Prairie Pothole Region in connection with our National Wetland Inventory effort. Photos of the Roseau River Basin were taken in May, 1980 for the express purpose of wetland delineation and "typing". Those photos are available to all agencies, and your District's Remote Sensing Coordinator was recently provided information on how they may be obtained.

Regarding ownership status (Step 2), I do not believe that present State ownership necessarily confers protection against wetland drainage. I will agree, however, that those wetlands within the boundaries of the Roseau River Wildlife Management Area would not be subject to future drainage.



My strongest concern is with the factors considered in determining whether individual wetlands are sufficiently worthy of receiving the additional protection provided by assumption of discretionary authority (Step 3). Given the present regulations establishing the Nationwide Permit Program, the requirement that a water body "...has values not normally associated with a nationwide-permitted water" or that it "...provides important functions which exceed those normally associated with a nationwide-permitted water body" appears reasonable. However, by means of the improved hydraulic conditions discussed at the beginning of this letter, the proposed flood control project would provide the only feasible means of drainage of what could be a substantial acreage of remaining wetlands. It seems unreasonable and inconsistent with our national wetlands policy as set forth in Executive Order 11990 to require that wetlands made vulnerable to development by a federal flood control project meet the same set of rigid biological criteria applied to wetlands threatened with non-federally-influenced development.

Finally, I don't believe that a lack of printed or published documentation relative to its use by threatened or endangered species, high production of waterfowl, use by great numbers of migrating waterfowl, shorebirds, marsh birds and wading birds, or the presence of flora or fauna at or very near the limits of their range provides a valid basis for dismissing any Nationwide water body from consideration for discretionary authority. While I firmly believe that the application of the present criteria to wetlands within the area of influence of the present project is inappropriate, I have little doubt that a close look at those wetlands would reveal existing qualities which would enable many of them to qualify under one or more of the biological criteria presently being used.

I hope you find this expression of Service views both constructive and beneficial. The U.S. Fish and Wildlife Service would be pleased to assist the Corps in this important aspect of the planning process.

Sincerely yours,



James L. Smith  
Acting Area Manager

cc: U.S. EPA, Chicago  
Minn. DNR, St. Paul



